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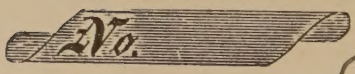

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ON

INTRA-THORACIC CANCER.

PART THE FIRST:

INTRODUCTORY AND HISTORIC SKETCH.

BY

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PREFACE.

The papers comprising part of the present essay have been published, at intervals, in the different periodicals. They are now collected with the hope that they may aid the pathologist, however slightly, in some future and more perfect description of a disease having, at present, many points defective in its history. Intra-thoracic cancer, using the term in its widest sense, occurs too rarely to furnish any single observer with the necessary *matériel* for a sufficiently comprehensive account of its nature, however extended his opportunities may have been. He must borrow from the general experience. This rarity of the disease may be pleaded in excuse for the poverty, in respect of number, of original cases. They are all that a fair experience in diseases of the chest, during the last twelve years, has been able to supply with requisite completeness. The absolute verification of some cases of strongly suspected disease has been frustrated by the insurmountable diffi-

culties attending *post mortem* examination. These cases, with two or three exceptions, are unrecorded. No particular distinction has been deemed necessary between the so-called primary and secondary cancer, the latter form when presenting marked chest symptoms being deemed co-ordinate. Such distinction would be chiefly important in a diagnostic point of view. When unusual or obscure chest symptoms supervene either upon external or internal cancer other than thoracic, the difficulty of diagnosis becomes, at times, proportionately lessened.

CONTRIBUTIONS

TO THE

LITERATURE AND PATHOLOGY OF INTRA-THORACIC CANCER.

The facility of generalising any given disease is manifestly determined or retarded by the frequency or rarity of its occurrence, and by the clearness or obscurity of its attendant symptoms. Thus, the general notions of fever and external inflammation, from the very prominence and daily manifestation of their phenomena, were acquired in almost the infancy of science. Of other rare and obscure affections, as intra-thoracic cancer, no adequate general idea could, until a later period, be formed. The ablest physicians of the last century watched, with astonishment, an affection not only presenting the most inexplicable symptoms, but successfully baffling every attempt at alleviation that matured experience could suggest. All conjecture seemed in vain ; theory after theory losing ground, until, at last, "*Atrox rarissimusque morbus*," breathed even Boerhaave in despair. At this period, so rare were the cases, and

rarer still, perhaps, the nicer discrimination of the morbid anatomist, that, beyond an imperfect and widely scattered individual record, no further advance in this department of pathology could be made.

Some facility for generalisation, however, is often indirectly afforded by directing the powers of observation upon the particular maladies of an organ. All foreign symptoms and pathologic results become, by the process of abstraction, gradually eliminated from one category, and, when subsequently analysed and compared, embraced under another more or less perfect. In this sense, Bayle, while studying the history of tubercular phthisis, excluded certain cases possessing properties in common, and grouped them under a special head, "cancerous phthisis." This denomination, however faulty, had, at least, the advantage of stimulating pathologists to more precise researches.

We may infer, then, that any given disease passes through a succession of phases prior to our recognition of its definite and perfect form. First, as derived from simple observation, the rude record of the individual case, or even the linking together of kindred cases having symptoms in common, but without the perception of their co-relation; next, the crude generalisation of the affection, which brings us, lastly, to the closer study of the disease under such generalisation, with the additional aids furnished by physical investigation. It is this latter stage alone which permits an approach towards Positive Science.

The materials for a pathological history of intra-

thoracic cancer have been accumulating in an accelerated ratio since the earliest cultivation of pathological anatomy. Many instances, some of imperfect detail, and others, perhaps, of more than doubtful character, are recorded in that great *repertorium* of the earlier anatomists, the *Sepulchretum* of Bonetus.

Among the older English physicians, there are few whose writings would better repay a careful perusal than those of Dr. Thomas Willis. His *Pharmaceutice Rationalis*, published in 1679, abounds in practical observations upon intra-thoracic diseases. He is quoted at present as being the earliest observer of a particular sign of cancer of the lungs, which has since arrested very forcibly the attention of many who have carefully watched the disease, viz., a peculiar fetid condition of the breath. In the second part of the work cited, sect. 1, chap. vii, p. 59, he records the singular case of a distinguished divine, Dr. Berwick. This patient, among other symptoms, suffered from frequent attacks of hæmoptysis; and, during each attack, from a horrible fœtor of the breath. After death, the entire left lung was found in a state of scirrhus.

De Hahen and *Schenkius* testify to the oft quoted case from *Van Swieten*, in which a scirrhous tumour of the upper part of the right lung had thrust the mediastinum and œsophagus to the left side, and so compressed this latter tube, that, above the obstruction, it was greatly dilated, and formed a kind of *diverticulum* for the aliments. *Hack* (*op. cit.*, 1750) also details a similar case in which deglutition was

impeded by a cancerous tumour of the upper part of the lung.

Barrere, whose anatomical observations, illustrating clinical medicine by autopsies, were published in 1752, narrates the following instance of cancer of the lung producing dysphagia, probably mechanical, by pressure upon the œsophagus. This forms a fitting complement to the narratives of De Hahen and Hack. A soldier, aged twenty-eight, weak and emaciated, had been attacked during eight months with troublesome cough. When admitted into the hospital, he was wasting from slow fever, and suffering from violent cough; the sputa, white and tenacious, but never purulent. A difficulty was experienced of lying upon the left side. Different remedies were tried in vain. Slight perspirations ensued; a sudden emaciation, dysphagia, extinction of the voice, and eventually, death. No diarrhœa occurred. The lung was universally adherent to the pleura, and its tissue filled with very small substances resembling millet seeds. On pressing the lung other tubera, very large and hard, were felt. When divided, they were filled with a white matter resembling soft gypsum. One only contained pus. The upper part of the superior lobe of the right lung was of stony hardness over an area equalling in size a hen's egg.

Lieutaud, in his more finished *History of Medical Anatomy*, has not only reproduced many of the cases of scirrhous lung from *Bonetus*, but has added others of his own. The sections "*Pulmones schirrosi et præduri*" and "*Tubercula*" determine most of the current knowledge of his time. He has also recorded

a very interesting case of mediastinal tumour. It occurred in a young man, who died, according to Portal, of phthisis. The mesenteric glands were excessively swollen; the pancreas indurated. The lungs were in a state of suppuration. The anterior mediastinum was filled by a fatty mass, weighing three or four pounds, which had both compressed and dislocated the aorta.

The volumes of Morgagni, so rich in facts connected with "The Seats and Causes of Diseases investigated by Anatomy", contain, comparatively, few notices of cancerous affections of the lungs. The great anatomist frankly avows his prejudice with regard to the examination of the bodies of subjects supposed to have died from consumptive disease, a prejudice common to his time, and evidently imbibed from Valsalva. There are, however, four cases recorded which may probably be included in the category in question. Yet Morgagni, with all his sagacity, did not perceive their true significance. By a singular coincidence, his very first letter opens with a case of encephaloid cancer, rendered the more interesting from the cerebral symptoms connected with it. A boy æt. thirteen, of consumptive family, who had suffered a year before from inflammation of the left lung, was seized with pain in the head, over the eyes, which were painful, and discharged viscid matter. The following day he became delirious, the eyes being fixed on those about him. He also threw up a little tough phlegm. Suddenly he was seized with convulsions followed by lethargy. Subsequently,

* Op. cit., vol. i, p. 30.

these convulsions became more frequent, and were attended with dyspnœa. There was no adhesion of the right lung to the pleura, but in the upper part of the organ, near the clavicle, was a tumour almost as large as a walnut, within which were little cavities, filled with a substance that, in colour and consistence, resembled the medullary matter of the brain. The posterior part of the left lung adhered to the pleura. An ounce of limpid serum flowed from around the origin of the optic nerves. The pineal gland was unusually large.

The second case was one that occurred in the practice of Valsalva. This likewise was evidently primary. The subject, a man, was fifty years of age. The symptoms were pain in the chest, thirst, cough, hæmoptysis, and dropsy of the abdomen and feet. He lay most comfortably with the head bent forwards. For a month previous to death, all pain in the chest had subsided. Eventually he died suffocated, after spitting up a large quantity of blood. The right lung was healthy, with the exception of great redness in its lower portion. The entire left lung, forming one common mass with the surrounding parts, was pallid, contracted and hard, and contained a sanious matter. The pericardium was universally adherent. There was great enlargement and adhesion of the spleen. Cartilaginous concretions also were discovered, adhering here and there to the urinary bladder.

The third case was one of secondary deposit. A woman, æt. forty, had a tumour on the inner

side of the right heel, which grew to the size of an adult head. Ulceration commencing, the tumour was removed. Twelve months later it began to grow again, and the woman, who had not previously complained of any chest symptoms whatever, was seized with frequent pain in the left side, accompanied with fever and dyspnœa. Before forty days had elapsed, dating from the attack, fresh dyspnœa ensued, combined with a sensation of tightness and suffocation, so that she was compelled to remain propped up in bed. The pulse, intermittent even at first, now became more so. Nevertheless, there was neither pain, cough, expectoration, nor fever, except during the last few days of life, when slight fever supervened. This symptom, and also the dyspnœa, were very troublesome at night. She was so emaciated and weak as to be scarce able to complain of an erosion in the fauces, where, however, on inspection, nothing could be seen. She died fifteen days after the final attack of dyspnœa had come on. Sanguineous effusion existed in the left pleural sac. The lower and anterior part of the left lung presented a great cavity, showing here and there extensive traces of a substance resembling a steatoma in point of whiteness and firmness, but when disturbed by the knife, it more resembled purulent matter. The remaining portion of the lung was congested. The right lung, less diseased, contained steatomatous tumours, smaller in size, and shut up in their own peculiar coatings. Further deposits existed in the abdomen.

The fourth case, a somewhat doubtful one, occurred in a man æt. sixty-six, long subject to catarrhal ex-

pectoration. At length, he took cold, and was attacked with acute pain in the left side, together with cough and fever. Having, from the first, expectorated thick and yellow matter, streaked with blood, he died on the seventh day, from sudden suppression of the expectoration. Turbid effusion existed in the left pleural sac, with partial adhesion of the pleura. The right lung was adherent to the mediastinum and pleura, where it invested the diaphragm, and, especially where it lined the upper ribs, anteriorly. In the last mentioned place, a cancerous ulcer was concealed in the lungs.

The memoirs of the Royal Academy of Surgery of Paris, forming the third volume published in parts, about the year 1780, include the famous article upon cancer, by Le Dran. This great surgeon indicates the frequency of secondary cancer of the lungs. He states that he has more than once opened the bodies of women who have died of suffocative dyspnœa, after being cured of external cancer by extirpation, and that in all such examinations he found the lungs affected with the original disease. In one case of cancer involving both lungs, the patient could obtain rest only with the head bowed upon the knees. Morgagni make the same remark in a similar case.

Le Dran furthermore shows how cancer of the breast may, gradually, implicate the pleura. He also details a most interesting case of cancer of the lung, having all the importance of primary disease, supervening a year and eight months subsequently to

amputation of the thigh for cancer of the foot. The symptoms were such as were supposed to indicate effusion into the pleura. Four pints of sero-sanguineous fluid were first removed by paracentesis thoracis, and two days later, two additional pints. After death the lung of the affected side was found to be scirrhous, of almost bony hardness, and, connected with it, two tumours, equalling the lung in size, hard, also irregular, and of the same character as that affecting the ankle.

The *Manual of Practical Medicine*, of Selle, the fifth edition of which was published in Germany in 1789, and subsequently translated into French by Coray, briefly alludes to the frequency of intra-thoracic cancer. The author, in the first volume, states that certain glands exist in the anterior mediastinum which frequently become the seat of secondary cancer; he does not, however, cite any cases in support of the proposition.

Voigtel published his *Handbook of Pathological Anatomy* at Halle in the year 1804. This work is almost essential to the pathologist from the research it displays, and the numerous references it affords to earlier and cotemporary writers. The ninth section of the second volume is devoted to the affections of the lungs, and pages 270-2 describe more particularly their cancerous diseases.

Among the numerous works with which the celebrated Portal has enriched medical science, not the least

important is that *On Pulmonary Consumption* (1819). Some of the cases contained in the first volume were, in all probability, examples of intra-thoracic cancer. Although the author has been scarcely alive to their true value, these cases are important, if only in reference to the symptoms they presented as compared with the *post mortem* results. We may particularise the following instances:—Case 1,—case 3—that of the exemplary Countess de Gisors, so touchingly told by Portal; case 9; article ii, cases 1 and 6. Another illustration of pulmonary cancer is also afforded by the author in his work on Rickets.

The name of Bayle stands pre-eminent in the history of pulmonary cancer. In his great work on Phthisis, for assumedly great it must ever remain, he first generalised the disease, and assigned to it a nosological position, by including his cases in a separate category of "cancerous phthisis." I record, says he, three observations, which appear to be sufficient for the recognition of this form of phthisis. The division he established has, I imagine, been far too hastily abandoned. Cancer may stud the lungs in successive deposits, precisely in the same way as that followed by ordinary tubercle, or it may infiltrate the tissue resembling in many respects tubercular infiltration. These forms of deposit may pass from crude to soft, undergoing central softening, forming, occasionally, excavations in the substance of the lung, yielding the same physical phenomena as phthisical caverns, and be attended with all the rational symptoms which characterise tubercular phthisis—pain,

cough, hoarseness, aphonia, dyspnœa, hæmoptysis, emaciation, debility with weak and rapid pulse, diarrhœa, slow fever, and profuse nocturnal perspirations.* In a word, cancerous is at times as well characterised as tubercular phthisis.

It would appear, therefore, that the division established by Bayle, though deficient in comprehensiveness, so far as it goes, is a legitimate deduction from the natural history of the disease, and his term as appropriate as that of tubercular phthisis. It may be urged that such forms of disease are unusually rare. So thought Bayle, for out of 900 autopsies of phthisical subjects there were but three where cancerous disease existed. He could, however, readily have swelled the list. There is little doubt that several of the cases classified under the head of phthisis with melanosis were in reality well marked instances of encephaloid cancer with melanic deposit. Consult more particularly his twenty-second case, in which pulmonary disease appeared to replace gout, and his twenty-first case, in which in all probability multilocular cancerous cavern co-existed. Bayle not only saw that cancer and tubercle might co-exist, and recognised the distinction between nodular and infiltrated cancer, but showed how frequently the bronchial glands were the seat of disease. The association with subcutaneous tubera is also noticed. See cases 35 and 37. He has, moreover, the merit of pointing out that these forms of disease are not merely adventitious products, as Laennec supposed, but that they are the

* Vide cases 1 and 5. *Aviolat*, case 3.

direct result of a constitutional cachexia. In his observations upon subcutaneous tubera, Bayle does not appear to have been cognisant of the writings of Pujol, or he would, perhaps, have laid more stress upon them. The last-named great physician not only traced the frequency and importance of these subcutaneous and glandular enlargements, and illustrated their bearing with especial reference to mammary cancer,* but showed further, under what circumstances they were to be regarded as the direct result of contamination of the system.

Laennec inaugurated a new era in the history of intra-thoracic cancer. Alike distinguished by the intrinsic excellence of his pathological descriptions, which, so far as they extend, are perfect in themselves, and by the invention of an additional aid to diagnosis, he rendered possible the detection during life of the signs produced by these abnormal deposits. His description of cancer of the pleura is both correct and concise. The form most commonly met with he describes as the encephaloid. It occurs in masses of variable size, rarely exceeding that of an almond, often mixed with pigment matter and strongly adhering to the pleura. In consequence, however, of the frequently co-existing effusion in the pleural sac, exploration is able to detect the result alone, the cause itself of such effusion being veiled, and requiring for its elucidation the concurrence of the general symptoms. When cancer involves the lungs it always assumes, according to Laennec, the encephaloid tuberous form. Three varieties, however, may

* Op. cit., vol. ii, p. 185.

exist—encysted, non-encysted, and, by analogy, infiltration of the tissue proper of the organ. This form of cancer assumes successively, the crude and stationary stages, and lastly that of softening and elimination. The brain-like matter is richly supplied with capillary vessels, which, from the extreme tenuity of their walls, become frequently ruptured, thereby causing a considerable admixture of fluid blood and clot with the cerebral matter, giving rise to the well known modification of "*fungus hæmatodes.*" Laennec states that these formations, ordinarily, induce neither fever nor alteration of the pulse, unless by virtue of position they excite more or less of local inflammation. Then, after a time, supervene febrile action, emaciation, and dropsy.

If criticism could find place in commenting on the labours of this great master, it might point to some particulars in which even Laennec was found wanting. In the first place, his researches did not embrace the various forms of cancerous disease, and were thus *pro tanto* incomplete ; nor was he happy in characterising encephaloid and analogous productions as "accidental formations." Had Laennec simply affirmed the deposition of cancer in any given organ to be a mere accident of the affection, the proposition would have been a sound one, whereas he incorrectly regarded cancerous deposit in the lungs as a wayward effort of nature, insubordinated to any known law. Cancerous deposit and that of ordinary tubercle are, in reality, but the material expression of a peculiar diathesis. Lastly, he has regarded cancer of the

lungs almost entirely from a pathological point of view. His essay is rather that of the morbid anatomist than of the clinical physician. This is the more surprising, when we consider the opportunities he evidently possessed, combined with his extraordinary skill in physical diagnosis. He affirmed on *à priori* grounds that the stethoscope would detect the deposit in question, but, practically speaking, the instrument was sterile in the hand of its master. His distinguished editor, Andral, has added to the original text two most interesting cases of mediastinal cancer.

The clinical diagnosis of intra-thoracic cancer, though in certain cases facilitated by the methods adopted by Avenbrugger and Laennec, is in truth of later date, and acquires fuller value from its association with certain general signs. There are no sufficient grounds for believing that even in Laennec's time any diagnosis of the disease had been made during life. So far as my knowledge goes, the first attempt at such diagnosis is to be ascribed to Dr. Baron. In the year 1819 this physician published the first portion of his work "On the Serous Membranes", a work that attracted attention at the time, and even subsequently, from the novelty of its doctrines. It is exceedingly pertinent to the subject of intra-thoracic cancer, from the number of cases of this affection therein detailed. Throughout the treatise, however, is manifested the constant endeavour of the author to weave all his pathological facts into harmony with his own peculiar views. While wishing to render full justice to the talent of Dr. Baron, the extent of his acquaintance with the literature of

his department, the value of the cases recorded, the accuracy of their detail, and the shrewdness of the diagnosis, we cannot suppress the feeling of regret that such treatment of his subject should be so much at variance with the spirit of philosophic moderation which pervades his introduction. The value of the second portion of the *Enquiry* likewise appears to me to be greatly diminished, not alone by this mistaken inference respecting the origin of the morbid changes which he discovered, but also by his very sorry criticism of the writings of Bayle and Laennec. With the questionable zeal of most one-sided observers, he has, indirectly at least, endeavoured to assail the reputation of these great pathologists. How little, perchance, did the enthusiastic advocate of the "hydatid theory" dream that the criticism passed upon their labours would, with progressing science, be found much more applicable to his own exclusive and now neglected views!

Joseph Frank, in the second part of the seventh volume of his celebrated work, *Praxeos Medicæ Universæ Precepta*, Turin, 1824, has devoted the sixty-sixth section to the consideration of "cancerous phthisis." This section is valuable as containing a succinct history of the knowledge of that period, together with copious literary references.

In the year 1826, Gintrac père first collated the better attested cases extant of intra-thoracic tumour, and published them under the title of "Steatomatous and Tuberculous Tumours of the Pleura," in his work upon the *Diagnosis of Thoracic Diseases*, a work

illustrating throughout the difficulties attending the diagnosis of thoracic disease. The value of Gintrac's collection of cases is much enhanced by his own admirable annotations and deductions.

The treatise of Lobstein on *Anatomical Pathology* was published in the year 1829. The first volume, article 2, on lardaceous substance, p. 396, contains an interesting case of cancerous degeneration of the half of the left lung occurring in a young man, nineteen years of age. The general signs appear to have been slight, and, as Lobstein states, by no means alarming. The duration of the disease was three years and a half. The fourth article, on Medullary Fungus, p. 432, records the extraordinary case, from Caillot, of a young woman, æt. 22, who died probably from secondary cancer of the lungs. The inferior lobe of the right lung contained a well marked cancerous cavern, five inches in diameter; a laceration, three inches long, had occurred in its wall, permitting the escape of cerebriform matter and blood into the cavity of the pleura of the same side. The superior cava contained a medullary tubercle the size of a nut. It projected into the cavity of the vein, and was covered by a fine membrane. This author also narrates two interesting cases of cancer of the tonsils, epiglottis, and larynx.

The *Dictionary of Practical Medicine and Surgery*, in 15 volumes, published at Paris in 1830, contains an article on intra-thoracic cancer, supposed to be in part contributed by Bouillaud, although probably by mistake, the name of Begin alone is appended

thereto. The article, although adding but little to the knowledge current of the symptoms of the disease, is nevertheless important from the cases detailed. Not one of these, however, presents to us the diagnosis as having been achieved. Three cases are brought forward of entire degeneration of the lung, and one of secondary cancer of the pleura from Richerand, perhaps among the most remarkable on record. Also, a case of cancerous tumour of the anterior mediastinum, which induced complete obliteration of the superior cava. The voluminous concretion obliterating the vessel was of grey colour, very solid, and exactly resembling the cancerous mass in the mediastinum. The concretion adhered firmly, as if by continuity, to one of the sides of the vein.

In January 1833, Dr. Sims read before the Medico-Chirurgical Society his paper on Malignant Tumours connected with the heart and lungs. Although one of the earliest, it may also be considered one of the most original and important clinical communications that has been contributed to this department of pathology. Indeed it is scarcely possible to over-estimate the value of this paper, not only from the number of original cases, and the variety of their detail, but from the excellence of the principles of diagnosis as applicable to malignant disease of the chest generally. This paper should be most carefully consulted and studied by all investigating the cancerous affections of the chest. They will find therein much that is of real importance for the

purpose of diagnosis, and much also that is rare in the morbid anatomy of the disease.

The writings of Cruveilhier abound in practical observations upon the subject of cancer of the lungs. Although the cases detailed are mostly those of consecutive disease, yet his admirable delineations of the morbid structures, and his commentaries upon the cases so thoroughly embrace the entire subject in its clinical and anatomico-pathological connections as to render their careful study indispensable to the inquirer.

The eighteenth fasciculus of his *Atlas of Pathological Anatomy*, plate 1, page 2, describes a case of encephaloid pulmonary cancer. The nineteenth fasciculus, plate 4, contains a well executed example of melanic cancer of the lungs and heart. The twentieth fasciculus, plate 1, shows accurately the wax-like patches of the pleura, and pages 3-5 of the letterpress contain the original description of the nature and mode of formation of this modification of the disease. In fasciculus 22, plate 1, another most interesting example of melanic cancer is given, with remarks upon the nature of subcutaneous tubera. Fasciculus 23, plate 5, pages 1-6, is most important, especially in reference to secondary cancer of the lungs. Fasciculus 27, plate 3, is again devoted to the illustration of the "plaques cireuses," and pages 1-5 explain how this formation occurs, at one time as the result of continuous disease, at another as that of constitutional infection. These patches may exist either with or without co-existing effusion into the

pleural sac, and stand to the pleura in precisely the same relation that tubercles do to other organs. Fasciculus 29, plates 2-3, depict a cancerous growth filling the cavity of the right auricle of the heart, auriculo-ventricular orifice, and opening of the cavæ. Most interesting remarks follow respecting the manner in which the circulation was maintained. Fasciculus 37, plate 4, page 3, illustrates and details the particulars of a case of encysted cancerous tubera of the lungs filled with semi-fluid *(bouillie)* contents.

In his latest work, *Treatise on Pathological Anatomy*, just completed, vol. ii, page 258, he considers in a brief section the general characters of cancerous tumours developed in the mediastina, and the symptoms thereby induced. He illustrates his subject by the details of a case of mediastinal tumour simulating aneurism of the aorta. After death a cancerous mass, the size of an adult head, was found situate behind the sternum and left ribs involving the fibrous layer of the pericardium. This tumour had dislocated the heart and great vessels, and flattened the left bronchus; it was, also, immediately continuous with an external swelling.

Hope, in his work on *Morbid Anatomy* (1834), devotes a section to encephaloid disease of the lungs, which, however, does not contain much original matter. In his description of the plates he details a case of encephaloid tumour. The plate, figure 37, representing these formations, is not very characteristic. Cancerous tubera and their ordinary position are better shown in the fourteenth figure of Bock's *Atlas of Pathological Anatomy*, published in 1855.

The third essay in the first volume of the *Studien im Gebiete der Heilwissenschaft* of Heyfelder, published in 1838, treats of cancer of the lungs. This most important contribution not only contains excellent literary references, but also details of two highly instructive cases of the disease, combined with clinical remarks of great value. A correct diagnosis was achieved in the second of these cases.

Carswell, in the third fasciculus of his *Illustrations, etc.*, embracing the subject of carcinoma, has, figure 5, given a most beautifully truthful representation of lardaceous degeneration of the entire lung. The boundary lines of the lobules are still clearly traceable. This pathologist also contributed the article "Scirrhus" to the *Cyclopædia of Practical Medicine.* His treatment of the subject, however, is perhaps rather in the direction of general than that of special pathology.

The article "Pulmonary Cancer," by Rostan, published in 1840, in the second edition of the dictionary, in 30 vols., is necessary for purposes of reference. It indicates with greater precision the physical signs denoting the changes which occur in the substance of the lungs, and would appear the result of considerable clinical experience. Rostan first alludes to the existence of the nodulated and irregular tuberous forms described by Laennec, and then proceeds to the third form assumed from analogy by this pathologist, viz., that of infiltration. Rostan had noted several examples of this form at the Salpetrière. After describing the stages of crudity and

softening, he details the symptoms produced by the affection. In a certain proportion of cases, slight dyspnœa and cough are alone perceptible at the commencement, subsequently increased oppression of breathing and violence of cough, pain in the chest, at first transient, gradually becoming, in some cases, almost intolerable, but without assuming the lancinating character indicative of ordinary external cancer. By degrees the cough becomes moist, the expectoration more or less abundant, and occasionally of remarkably white colour. No fever is apparent until the tumours excite irritation ; at a later period the pulse quickens, the skin acquires a yellow tint, sudden emaciation occurs, followed by œdema, fetid breath, diarrhœa, and death. Rostan furthermore states, that when symptoms of phthisis supervene in the case of a patient suffering from the third stage of external cancer, there is reason to infer the existence of cancer of the lungs. He has himself, occasionally, been thus led to a diagnosis of the disease during life. With respect to the physical signs of the disease he asserts that percussion can detect the presence of the cancer masses when they attain a certain size. Should marked compression of the lung tissue ensue, the normal respiratory murmur is gradually lost, and becomes replaced by bronchial breathing and bronchophony. Pectoriloquy occurs but rarely, in consequence of the softened matter being seldom evacuated through the bronchi.

In the thirteenth number of *Guy's Hospital Reports* for October 1840, Dr. Hughes has communicated the

results of his experience in malignant disease of the lung. The cases brought forward, four in number, possess much interest. In the first, which was one of fungoid disease of the upper part of the right lung, the physical signs were of a similar character to those noted by Rostan as being frequently present. Dr. Hughes, moreover, notices the alteration in shape of the right infra-clavicular region as exhibiting marked flattening and depression. In his second case, also one of fungoid disease of the right lung, the right side of the chest was full and prominent, and eventually the heart was displaced to the left side. The entire lung had undergone degeneration with the exception of a small portion of the apex. Dr. Hughes, here, first observed the expectoration assuming a very peculiar character, viz., that of a pink viscid fluid, a fact to which he attached great importance. It is curious, as he remarks, that Dr. Stokes also had noted a peculiarity of the expectoration in similar cases. The latter, however, compared it to black currant jelly, while Dr. Hughes found it more resembling the red description. Either form of expectoration is of significance when it occurs, but is often unfortunately altogether wanting. The concluding remarks of Dr. Hughes must be considered of the highest value in a practical sense, and are in the main confirmatory of those of Dr. Stokes.

Dr. Stokes, in this country, has done, perhaps, more to elucidate the clinical history of intra-thoracic cancer than almost any other observer. Indeed there are few subjects in the department of thoracic patho-

logy that he has touched and not adorned. Happy alike in the originality of his views as in all the essentials of detail, he has paved the way for a more enlightened study of the disease than could have been deemed practicable in so comparatively short a period. His first work, *On the Diseases of the Chest*, 1837, was followed by his admirable and well-known memoir, contained in the *Dublin Journal* for May 1842. These contributions, to which it is unnecessary to do more than refer, embodying the results of his own experience and that of the lamented Dr. Graves, show, as he states, how much our knowledge has progressed. The great value of his writings consists, for the most part, in demonstrating how largely certain local and general signs, independently of mere physical exploration, concur in enabling us to form a judgment respecting the affection. And clearly it is to views like these that we must incline for the ultimate perfection of our diagnosis.

There stands forth another advanced pioneer of science in this particular domain, whose work on cancer contains ample special information. I allude to Dr. Walshe. In the last edition of his *Treatise on Diseases of the Lungs* (1863) he has, with briefness, given the results of a larger experience of intra-thoracic cancer. This volume is, also, so well known that its bare mention suffices for the present purpose.

The dissertation of Kleffens *On Pulmonary Cancer* was published in 1841. He has recorded and carefully analysed twenty-seven cases of the disease. This essay is important chiefly for purposes of reference.

About twenty years subsequently to the appearance of the treatise of his father (1845), Henri Gintrac published his thesis upon Intra-Thoracic Tumours. This essay comprises almost every case bearing upon the subject, and is, additionally, enriched with original ones of his own. It is by far the most extensive collection we possess, and at the time of its publication was well nigh exhaustive of the subject matter. To the student of this class of diseases it may be deemed absolutely indispensable, being full of most instructive detail.

The analysis of cases of pulmonary cancer by Kleffens has been just alluded to. A fuller account, however, is to be found in the *Inaugural Dissertation* of R. Köhler, published at Tubingen, in the year 1847, in which he brings forward seventy-five cases of primary and secondary cancer. In fact, the most comprehensive record extant of cancer of the lungs is here presented. Köhler has more recently (1853) systematically elucidated the morbid anatomy and pathology of intra-thoracic cancer generally, in his enlarged treatise on cancerous and cancroid affections.

Dr. Kilgour has furnished two articles upon cancer of the thorax. The first appeared in the *Edinburgh and London Medical and Surgical Journal* for October 1844; the second, in the *Edinburgh Monthly Journal* for 1850. Although many of the cases were of cancer commencing, probably, in the chest-wall, others are unquestionable examples of mediastinal tumour either pressing on, or involving, the heart. Perhaps

one of the most remarkable facts observed in connection with two of these cases (6 and 9) was the occurrence of unilateral sweating. This phenomenon, specially noted as being bounded by the median line, is of the utmost interest, especially when viewed in conjunction with the observations of Dr. Gairdner upon aortic aneurism (*Clinical Medicine*, p. 558.)*

Lebert, in his *Treatise on Cancerous and Cancroid Affections*, p. 185, has devoted a short section to the subject of intra-thoracic cancer, in which, however, he adds but little to the actual state of knowledge, his remarks being chiefly borrowed from the writings of Dr. Walshe. But in his more recent and splendid work upon *Pathological Anatomy*, he has, from original cases, illustrated the malignant diseases of the lungs and pleura. One highly important and almost unique case of colloid cancer of the lungs is detailed in the letter-press to vol. i, p. 321, and illustrated by figures 1 and 2 in plate 44.

The last monograph of importance bearing on the subject of cancer of the lung, is by Aviolat, 1861. This thesis contains ample information upon nearly all the controverted points relating to the

* The paper by Dr. Budd, "On some of the Effects of Primary Cancerous Tumours within the Chest" (*Med.-Chirg. Trans.*, vol. xlii, 1859), should be referred to in connection with the subject of pressure, by tumours, upon the nerves. The able writer supposes that the adhesion of the pleura, the condensation, and purulent infiltration of the lung, and the effusion of lymph upon the surface of the pericardium, more or less frequently observed in such cases, are the results of the pressure upon the nerves by tumours involving the root of the lung. This view, however, requires further development.

special pathology of the disease, with the addition of a few rare, well-detailed, and original cases. Its perusal cannot be too strongly recommended.

Trousseau, in his *Clinical Medicine*, furnishes some excellent practical observations on cancer of the pleura. He specially indicates the occasional value of sanguineous effusion, removed by thorocentesis, as a diagnostic sign of the malady in question. This truly practical physician has quoted the valuable essay of *Lacaze-Duthiers* upon this disease, which thesis being out of print, I have not been fortunate enough to peruse the cases recorded therein.

The fifth and concluding volume of Cruveilhier's work on *Pathological Anatomy* (1865) treats exclusively of cancer and cancroid formations. Its more interesting portion in connection with our subject, is that which relates to cancerous embolia (page 282). The author's views respecting the affection thus designated, originated in a case of cancer of the heart, lung, and pleura, occurring in the practice of Dr. Herard. The only diagnosis possible, during life, was that of "Pulmonary tuberculosis with effusion into the right pleural sac." After death, sero-sanguineous effusion and large coagula of blood were found within the pleural sac. Large cancerous masses extended over an extensive portion of the lung tissue, the most voluminous of which had destroyed the right bronchus. Smaller masses of rounded form, the size of a cherry-stone, surrounded with ecchymoses, projected from beneath

the parietal layer of the pleura: which layer was, also, found to be the seat of cancerous degeneration. The inferior lobe of the left lung contained one small unsoftened tuber. The superior and a portion of the anterior face of the left auricle were transformed into a schirrous mass possessing the anatomical and microscopical characters of cancer. The endocardial membrane of both auricle and ventricle was intact; nevertheless, cancerous *débris* were found (or supposed to be found) in the cavity of the left ventricle. The inference drawn therefrom was, that this *débris* originated in a distant source and had been conveyed to the ventricle through the medium of the circulation. Cruveilhier makes the following remarks upon the above conclusion:—"The details furnished respecting these assumed cancerous *débris*, some of which were free in the chamber, some retained between the fleshy columns of the heart, and others churned into actual red coagula interlacing with the tendinous fibres of the mitral valve, are very far from inducing conviction in my mind. Even conceding the possibility of a transmission of cancer-juice (either developed within, or penetrating the veins) into the circulation, I should hesitate before admitting the existence of cancerous embolia, for the reason that cancer-juice is not susceptible of coagulation. It would, therefore, be necessary to assume that a portion of actual cancer tissue (juice and parenchyma) had directly penetrated a vein, which is impossible. Again, supposing, as before stated, that cancer-juice could penetrate a vein, it would not coagulate, it

could at best become encased in a fibrinous clot. It is just possible that the kind of puriform *bouillie* found at times in the centre of fibrinous clots, in cases where death occurred after a prolonged agony, might have been mistaken for cancer detritus.

The same objection is urged in a case by Lancereaux, of supposed cancerous embolia (based on the perfect identity of the products) consequent upon cancerous degeneration of the left lung, where an irregular fragment of cancerous tissue was found in the aorta. An interesting parallel is drawn between cancerous and purulent infection, for particulars of which reference must be made to the volume in question.

The foregoing sketch must not be considered as exhausting the subject of intra-thoracic cancer, even in its literary aspect. It is put forward simply with the view of tracing the various progressive steps of science in relation to points of clinical and pathological importance, and of detailing such individual cases as appeared to me to possess a special value in connection with this subject.

For the convenience of those who may be desirous of investigating it more thoroughly, in addition to the references given in the commentaries on my own cases, the following list of authors, treating more or less fully of the disease, is annexed. Uncollated cases, however, are still to be found scattered through the periodicals.

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CONTRIBUTIONS

TO THE

PATHOLOGY OF INTRA-THORACIC CANCER.

PART II.

What ages has cancer been known,—how definite the characters it mostly presents when accessible to observation,—rich, almost to excess, is its literature, and yet, even at the present hour, what diversity of opinion respecting its pathology, histology, and very basis of classification!

Some able men among us still maintain surgical cancer, at least in its earlier stage, to be a purely local and eradicable affection,* and its nosological position, consequently, to rank under the order "Locales," rather than that of the "Cachexiæ"; while others, stedfast in the ancient faith, regard the disease as remotely originating in some unknown (perhaps unknowable) constitutional condition, either original or acquired, designated "cancerous diathesis," or, the disposition to cancer. These two dominant views respecting the efficient cause of cancer, thus confronted, show the latter, or *Metaphy-*

* See a Lecture by Mr. Spencer Wells, *Med. Times and Gazette*, 1864; also a valuable paper on "The Antecedent Conditions of Cancer", by Mr. C. H. Moore, Surgeon to the Middlesex Hospital, *Brit. Med. Journ.*, Aug. 26, 1865. The arguments on either side are, here, most lucidly and impartially stated.

sical,* in, seemingly, irreconcileable antagonism to the former, or *Positive* view.

One section of the histological school, headed by Lebert and Robin, proclaims the existence of a specific cell or nucleus; another, led by Virchow, Henle, and Bennett, affirms such proposition doubtful, perhaps entirely false. The former school also enforces the doctrine of the pathological unity of cancer. Cruveilhier,† on the other hand, and his followers, assert that between colloid and ordinary cancer a difference exists, not only *quoad* genus, but almost *quoad* nature. According to the latter pathologist, the milky, emulsionable juice is pathognomonic of cancer proper, thus constituting a specific difference between this form of the disease and colloid degeneration. But whether the further distinction between colloid and cancer proper, insisted on by Cruveilhier, be a just one, viz., the limitation of colloid to extension by continuity or contiguity over circumscribed regions, and its inability, as a rule, to generalise itself in the economy by *infection* as cancer proper, and whether when colloid and cancer coexist (which they occasionally do) they are to be regarded

* In the sense, that with the upholders of this view, the unknown factor is a compulsory inference to explain some of the observed phenomena of the malady.

† Une étude comparative plus complète de ces deux lésions m'a montré que leurs caractères différentiels établissaient entre ces deux lésions non-seulement une différence d'espèce, mais une différence de genre et j'oserai dire de nature.—*Op. cit.*, t. v, p. 189.

To my mind, the very cases cited by Lebert, in his essay on "Colloid Cancer" (Virchow, *Archiv*, etc., b. iv, p. 291, 1852) harmonise with the view of Cruveilhier.

as varieties of a common form or as distinct entities accidentally conjoined, and not necessarily connected, are points to be regarded *adhuc sub judice.*

Some most interesting examples, however, of unmixed colloid invading the thoracic organs secondarily, cited by Cruveilhier, appear, to some extent, to give colouring to his view.

In the first case,* the disease extended from the thoracic parietes directly into the chest. The pleura, mediastinum, diaphragm, axillary glands, and both lungs, were extensively affected. The abdominal organs remained entirely exempt from the disease, the thoracic zone being alone engaged. In the case from Lebert, colloid cancer of the left mammary gland had existed for twelve years. During the last three years, symptoms of acute disease of the right lung supervened. *Post mortem* examination revealed colloid of the left breast, axillary glands, both lungs, the serous investment of the diaphragm, mediastinum, and bronchial glands. The organs of the other cavities remained healthy.† In this instance, also, the thoracic zone was alone involved. In a third case, that of a young woman aged twenty-one, the contents of both thoracic and abdominal cavities had undergone extensive colloid degeneration. The diaphragm appeared greatly thickened from the disease engaging both its peritoneal and pleural aspects. The fourth case‡ recorded is of the greatest importance with reference to the distinction supposed by Cruveilhier to exist between colloid and cancer

* Op. cit.. p. 59. † Op. cit., p. 80. ‡ Op. cit., p. 84.

proper. The reporter is Dr. Verneuil. The patient was sixty years of age; a large ulcerated tumour, the size of a fœtal head at term, occupied the left breast. After death the tumour was found to combine both the colloid and encephaloid kinds of cancer, the former degeneration contributing by far the larger part. The pleura had undergone very extensive colloid degeneration; the lungs, also, contained four or five nodules the size of a nut, formed of pure colloid; smaller tumours, apparently encephaloid, occupied the diaphragmatic pleura. The axillary glands were much enlarged, but, unfortunately, no observations were made as to the precise nature of their degeneration. In this most interesting case, not only did colloid and encephaloid primarily coincide, but the transplant also was of binary character, the colloid furnishing by far the larger contingent, maintaining in this particular the proportion it bore in the mammary disease.

While, therefore, in the present state of science, opinion is so divergent on such cardinal points in the pathology of cancer, it may be safer to include schirrus and encephaloid alone as species of the genus carcinoma, and to regard schirro-encephaloid, hæmatoid, melanoid, reticulate, or phymatoid, as modifications of species depending either upon histological differences, admixture of accidental elements, or as regressive forms of disease, leaving colloid, provisionally, in a separate category, until its actual range of infecting power is more accurately determined, and the contrasted differences reconciled.*

* The views of Mr. Paget respecting colloid cancer must be carefully

Primary Cancer. The material expression of the diathesis, may be deposited in one or more organs simultaneously or successively, and potentially, involve adjacent tissues by continuity or contiguity.

Secondary Cancer. The infection of near or remote tissues by direct contamination of the blood or contents of the absorbent vessels, and subsequent extension by continuity or contiguity.

Seat of Intra-Thoracic Cancer.

- Lung proper ...
  - nodulated
    - encysted.
    - non-encysted.
  - infiltrated
    - general.
    - partial.
  - acute miliary cancer.
- Pleuræ.
- Mediastina.
- Pericardium.
- Thymus gland.

All these forms may be more or less combined, so that it is in many instances difficult, if not impossible, to isolate them. Acute miliary cancer is not well described clinically, and is, perhaps, now and then overlooked pathologically, in consequence of the histological elements possessing no typical form.

Forms of Intra-Thoracic Cancer. When cancerous

considered. Should it prove correct that this form of disease depends upon cystic change in the very earliest period of the cancer structures, the infecting power of the disease may be restricted by such change.

Where multiple deposits of colloid occur (which Cruveilhier admits occasionally happen) the important question to decide is, are such deposits of primary multiple, or of really secondary origin?

tubera stud the surface or invade the deeper tissues of the lungs, they are not unfrequently found (notwithstanding the assertion of Laennec) of scirrhous, but more commonly either of scirrho-encephaloid or pure encephaloid, form, mixed at times with more or less melanic pigment matter. The irregular tuberous masses of infiltrated cancer, more frequently occupying the middle lobe of the right lung, as pointed out by Dr. Walshe, often contain a somewhat large percentage of the scirrhous with predominance, however, of the encephaloid element. When the entire lung has undergone transformation, the mass is almost always found to consist of the softer form of cancer. Exceptions, however, occur. Albers records a case of scirrhous lung, secondary to cancer of the stomach. Begin, too, in the essay, conjointly with Bouillaud, in the *Dictionary of Practical Medicine and Surgery*, in 15 volumes, met with an instance in which the entire lung was transformed into a scirrhous mass. A case of the reticulate cancer of Müller, occurring in the lung, is recorded by Dr. Jenner.* This form, however, may be a transition one.†

Colloid cancer is, beyond doubt, the form most rarely occurring primarily in the lungs. Comparatively few cases are recorded, and these of very doubtful character. It may exist either in the form of tuber or infiltration; simple, or mixed with the scirrhous or encephaloid forms. In addition to the cases already cited, others are recorded by Hasse and Warren. One of the most interesting

* Path. Trans., Sixth Session, 51-52. † Förster, op. cit., p. 93.

examples I have found of secondary cancer of this description is detailed by Sir E. Home.* Nearly complete degeneration of both lungs existed. In some places the tubera had arrived at a species of suppuration, the whole of the lungs were broken down into one mass, and matter was found in the trachea. Some of the smaller tubera were more fibrous; others, the size of a small egg, or even smaller, when cut open had the appearance of being made up of a number of parts, in substance between jelly and cartilage, not unlike the internal structure of a shaddock.

Aviolat† gives the following analysis of 48, and Walshe of 58 cases of cancer of the lungs:—

Scirrhous	7	Scirrhous	9
Encephaloid ...	22	Encephaloid ...	38
Mixed	15	Mixed	5
Colloid	3	Hæmatoid... ...	1
Fibro-plastic ...	1	Doubtful	5
Total	48	Total	58

Intra-thoracic cancer of every form exhibits a singular proneness to inflammatory action terminating in the ordinary results—suppuration, ulceration or gangrene. It may, also, undergo a process of softening and elimination. This process obeys the law observed in ordinary tubercle, commencing in the centre of the mass. Many examples of cancerous cavern (the majority, it is true, post mortem results) are now on record. Cream-like matter, at times highly fetid, or mixed with blood and pus or minute

* Obs. on Cancer, p. 76. † Op. cit.

portions of sphacelated or calcareous matter, may be expectorated, as in tubercular phthisis, when the excavation communicates with the bronchi. There is a unique example recorded by Cailliot in which rupture of the softened cavern walls occurred in the lower lobe of the lung, and blood and detritus escaped into the pleural sac. In the cases of Morgagni, Corvisart and Leroux, excavation also existed in the lower lobe of the lung. Another remarkable instance is recorded by Dr. Stokes, where, with cancerous degeneration of the entire lung, a large portion was burrowed by anfractuous excavations, communicating on the one hand with the bronchial tubes, and on the other terminating in fistulæ, running in various directions to the surface of the lung, where they ended in superficial cavities containing air and a whitish purulent fluid, bounded on one side by the posterior surface of the pulmonary pleura, and, on the other, by the degenerated pulmonary substance. This dissection of the pleura from the lung extended over nearly the lower two-thirds of the organ. For an example of softening of pleural or mediastinal cancer simulating empyema, consult Case 2 and commentary.

Nodulated Cancer of the Lungs occurs either as a primary or secondary formation (Cases 1-5). The tubera vary in shape, but are usually rounded or ovoid, and of smooth, though occasionally, of uneven surface. They also vary, almost infinitely, in number and size:—in number, from one or two isolated tubera

to a complete studding of the surface of the lungs;—in size, ranging from that of a pin's head to a chestnut, or even larger. Those situate upon the surface are, for the most part, scattered equably over the anterior aspect of the lungs, forming and developing in the subserous connective tissue immediately beneath the pleura, and simply crowding back the lung substance, leaving intervening spaces of healthy or merely condensed tissue. Other tubera, again, and these usually the larger, arise deeper in the substance of the lung, but whether primarily developed in the air cells or interlobular tissue is not even yet decided. Such are generally of spherical shape; at times, when tending towards the centre of the lung, they draw the investing pleura inwards, causing on the surface cup-shaped hollows precisely similar to those observed in some cancerous hepatic tubera; at other times they approach the surface, and carrying the pleura before them, become either flattened and sessile, or rounded and pedunculated. In some cases to such an extent does a tuber expand, as to acquire all the characteristics of an intra-thoracic tumour. These tubera are of diverse colour and consistence, being at one time of scirrhous hardness; at another of brain-like softness, or that compounded of the mixed form, traversed more or less extensively with capillary vessels; and at times infiltrated with blood, pus and fatty, calcareous or pigment matter.

These tubera are simply separated from the proper tissue of the lung by an atmosphere of imperfectly condensed connective tissue. This is the ordinary

form observed; they may, however, be contained in a genuine cyst membrane. Their more important characteristic consists in their being altogether extraneous to the actual lung tissue, differing essentially from the tuberous masses of infiltration.

The true encysted form of nodulated cancer would appear to be singularly rare. Aviolat* states that he has only succeeded in collating two unequivocal examples. The ordinary expression "encysted tubera" must consequently be understood as simply referring to the common form separated by the layer of condensed tissue alluded to from the parenchyma of the lung. This statement of Aviolat is to a certain extent confirmatory of that of Walshe.† This latter excellent observer, however, is perhaps too exclusive in his denial that tubera are ever truly encysted. The cases cited by Aviolat appear most convincing. One is described by Deville (*Bull. de Soc. Anat.*, 1846). The second case, even still more conclusive, is recorded by Laennec in the *Memoir on Cancer*, by Bayle and Cayol. A large number of isolated tubera, all encysted, existed in both lungs. These cysts, resembling each other, were formed of two distinct membranes easily separable by dissection. The outer membrane, thin, composed of cellular tissue and blood-vessels, adhered to the substance of the lung; the inner membrane, about half a line in thickness, but varying in this particular in places, semi-transparent, formed of homogeneous tissue, in colour pearl grey, resembling at first glance a thin carti-

* Op. cit., p. 15.

† Op. cit., p. 533.

laginous layer, traversed by small capillary vessels on its outer, without being detected on its inner surface. These cysts contained, within, tumours possessing a lobulated surface, resembling the convolutions of the brain. They were composed of encephaloid matter of more or less soft consistence. In the interior of some there were excavations, resulting from destruction of the brain-like matter; while in others there existed effusion of blood. To complete the description of the character of these encysted tumours, according to Laennec, their volume oscillated between a bean and moderate sized apple. The tumours adhered but slightly to the cysts, and were easily enucleated. They were separated from them by fine cellular tissue supplied with delicate vessels, resembling in this respect the pia mater, which, also, is thus isolated from its envelope; the cyst membrane did not pass down into the anfractuosities which separated the convolutions, causing it to lose this appearance. These cysts contained encephaloid matter in a state either of crudity or softening, or mixed with melanic matter. In a word, they differed from ordinary tubera only by the possession of a cyst.

Aviolat might additionally have quoted Morgagni. This great observer seems to have had in view a case of encysted tubera from the following description. In his 22nd letter, art. 22, he expressly states, when speaking of a case of cancer, "the right lung contained fewer of those steatomatous tumours, which were, also, less in size, and seemed to be *shut up in their own peculiar coats.*"

Infiltrated Cancer of the Lungs. This condition is anatomically characterised as follows. First, as nodular or tuberous masses of variable size, often more or less circumscribed, bounded by no limitary membrane, but formed by, and springing directly from, the parenchyma of the lung, and very frequently the middle or lower lobe of the right lung. The tubera, in some cases, form large irregular masses, while in other cases they more resemble in size the ordinary non-encysted tuber. An isolated growth may become pedunculated and expand into the cavity of the chest, giving rise to all the signs and symptoms of ordinary intra-thoracic tumour. Many of the cases placed in this latter category by Gintrac fils were unquestionably those caused by such expansion of the infiltrated tuber, the connection of the growth with the true lung tissue being proved by the post mortem results. The second form of infiltration does not necessarily induce marked irregularity of the surface of the lung, but consists in a deposit within the tissue of the organ, at one time of a circumscribed space, at another of small scattered patches over the surface and within the tissue. These scattered patches probably act as foci for the extension of disease, gradually terminating in a degeneration, more or less complete, of the entire lung. In some instances, the degeneration is so far incomplete as to leave, at least, the traces of the lobules still uneffaced; while at other times, so marked a transformation has occurred as to render the lung one smooth, compact, heavy, homogeneous mass, without even a vestige of its

original structures. In both the tuberous and simply infiltrated forms, then, the normal histological elements are partially or completely replaced by cancerous growth, associated at times with certain foreign elements, as blood, pus, serum, pigment matter, fat, saline and calcareous compounds, or the decomposing débris of the tissues. In some cases the larger bronchi may be either partially or completely flattened or converted into hollow and solid cancerous tubes, within which the disease may penetrate and freely grow.*

The large arterial and venous trunks may also be more or less obstructed. In one of the cases narrated by Heyfelder,† the pulmonary arteries and veins were, *ab origine*, so compressed as to be converted into solid ligamentous cords. These vessels, in other instances, have become perforated, filled with cancer matter, and coagulation of the contained mass of blood produced.

Although in cancerous infiltration of the lung contraction of the organ may subsequently ensue, yet, as in ordinary tubercle, and most inflammatory conditions of the lung, there is, at first, local or general increase of volume. The researches of Woillez seem to place the occurrence of this augment beyond doubt. One of the most convincing cases of actual enlargement of the chest occurs in the case recorded by Heyfelder.‡ The disease appeared to be of the scirrho-encephaloid form. All distinction of lobes and fissures was obliterated, the lung being fused into

* Walshe, op. cit. † Op. cit., p. . ‡ Op. cit., p. 69.

one mass, the augmented volume of which not only caused preternatural dilatation of the left half of the thorax, occupying the normal site of the heart, and dislocating this organ to the right side, but itself actually filled part of the right side. The disease formed, moreover, an external tumour. In one case of Dr. Hughes', also, marked enlargement of one side of the chest existed. Other cases might be cited to the same fact. It is, then, most probable that, at least, in the early stage of cancerous infiltration of the lung actual increase in the volume of the organ occurs. Subsequently, however, from replacement of the normal tissue by cancer growth, and from the probable collapse of adjoining portions of healthy tissue from the pressure of the diseased part, contraction of the lung ensues. When cancerous condition of the pleura coexists, the pressure exercised upon the lung by the induration of the investing membrane would greatly tend to promote retraction of the lung. Effusion into the sac of the pleura, though subsequently absorbed, may powerfully concur towards the same result. Even after retraction of the lung has occurred in the manner stated, dilatation of the affected side of the chest may ensue from the gradual increase of the infiltrated mass.

Bronchial Glands. These structures are frequently found involved in the disease, being swollen, softened, and otherwise more or less degenerated. It is of importance to examine carefully the condition of the glands in every case of intra-thoracic cancer, since,

according to Dr. Wilks, they are often the immediate starting points of the disease.

With regard to the relative frequency of these two forms of intra-thoracic cancer, viz., tumour and infiltration, and to the tendency they exhibit to invade one or both lungs, the following statistic is given by Aviolat.* Of 18 cases of non-circumscribed infiltration, the disease was 16 times simple and 2 double; of 5 cases of infiltration and tumour, 4 times double and 1 single; of 5 cases of circumscribed infiltration, 4 times double and 1 single. Of 20 cases of isolated tumour, 9 times simple and 11 double. From this analysis it would appear that, in proportion as cancer is deposited as an extensive infiltration, it tends to restrict itself to a single lung; in proportion as the isolated patches and nodules multiply, they tend to develop in both lungs. Finally, independent tumours more frequently involve both than a single lung. Isolated tumours are also said to exhibit a tendency to concentration near the pleural surface, while infiltration more frequently involves the middle lobe of the right lung. It seems certain that both lungs may be simultaneously the seat of cancer deposit, or that such deposit may be limited to a single lung. When the disease affects both lungs, it may be in very unequal degrees, one lung being extensively compromised, while but slight deposit exists in the other. Observers, however, are not altogether in accord as to the relative frequency of the lung affected. Aviolat gives the following result. Of 48 cases, the affection

* Op. cit., p. 40.

was double 22 times, single 26. Of these latter cases, the disease occupied the left lung 14 times, the right 12. Out of 23 cases of primary cancer, Aviolat found the disease 20 times simple, and only 3 times double. Of the 20 simple cases, the disease was seated 11 times on the left, and 9 times on the right side. Of 10 cases of secondary cancer comporting themselves as primary ones, the disease was 5 times simple (4 to the left, and 1 on the right side), and 5 times double). Finally, of 15 cases of ordinary secondary cancer, the disease was only once simple. As Aviolat remarks, the result is striking. In the first variety, the disease is almost always simple; in the second, a kind of intermediate form, the proportion is equal; while in the third variety it is almost constantly double. With regard to the lung affected, Kleffens* states that of 19 cases, the proportion was 6 double, 7 on the left side, and 6 upon the right. On the other hand, Walshe and Köhler arrive at the following results:—

WALSHE.

Right lung				...	13
Left lung				...	5
Both lungs				...	3
Right lung and		ant.	mediast.	...	2
„	„	post.	do.	...	1
„	„	both	do.	...	3
Left	„	ant.	do.	...	0
„	„	post.	do.	...	1
„	„	both	do.	...	0
Both	„	ant.	do.	...	1
„	„	post.	do.	...	0
„	„	both	do.	...	0
					29

Köhler gives the following table of 31 cases of primary cancer, the majority isolated—

* Op. cit.

Right lung	15	
Left lung	8	
Both lungs	8	
Predominant in the right		3
„ „ left		0
Both equably		5
	31	8

Dr. Walshe has made the important statement that, although the lungs are very frequently affected by secondary deposit, conversely they are but little prone, when primarily affected, to develop secondary deposit in organs other than thoracic. Exceptional cases, however, are recorded in which primary cancer of the lungs probably gave rise to secondary deposits.*

Condition of Lung in the proximity of Cancer Formation. Nodular deposit, infiltrated tuberous masses, or simple infiltration, of limited extent, may leave for a time interspaces of healthy or nearly healthy pulmonary tissue. But when such tubera or infiltrated masses tend to approximate, they condense or irritate the intervening portions of lung, giving rise to diversified changes in its tissue. These changes consist either of such as render the remaining portions of lung less dense—atrophic rarefaction with destruction of the capillary vessels, or the tissue may be condensed by congestion, hepatisation, pulmonary apoplexy, lobular collapse, or softened by extensive suppuration, or by more or less of œdema of the ordinary form, or the black œdema of Cruveilhier—occasionally even minute portions of gangrenous

* Köhler, op. cit., p. 621.

tissue are observed. Where, however, the lung is found gangrenous over a larger area, pressure upon the nutrient vessels near the root of the lung has been ascertained to exist. The bronchial tubes leading to the diseased portion of lung are frequently inflamed and filled with muco-pus. The corresponding lung, if unaffected by cancer, may finally become emphysematous, or congested, hepatised, and dropsical.

Is Pulmonary Cancer capable of spontaneous arrest? It is a deeply interesting question, but one, unfortunately, incapable of present satisfactory answer, respecting the extent to which nature is capable of arresting the progress of pulmonary cancer. Judging from analogy, of the process by which ordinary tubercle becomes obsolescent, it is not impossible that even cancer may become modified so far as regards its destructive tendency. It is true that a wide difference exists between the active life of cancer and the low vitality of tubercle; still, the process of arrest may ensue in the former, although by a different process. The researches of Dietrich, Oppolzer, and others seem to show that hepatic cancer may undergo at least partial arrest by fatty metamorphose. Many years ago I myself saw an extensive cancerous mass in the liver partially changed into a kind of fatty matter, although I was unaware at the time of the significance of the fact.

Fatty infiltration of cancerous lung deposit has been several times observed, showing the general

tendency in cancer to this form of change. Köhler* asserts that Bell has most clearly described fatty infiltration of cancerous tubera of the lungs. These tubera were externally of cartilaginous hardness; internally soft, of caseous consistence, yellow coloured, and fatty.

Cless once found, in a case of encephaloid degeneration of the entire right lung, scattered cretaceous matter. Ribes, also, a most eminent pathologist, describes concretions intermingled with the milky cancerous fluid, which he compared to true osseous spiculæ rather than to the cretaceous degeneration of tubercle. Even from this too scanty *matériel*, we may, perhaps, discern evidences of the possibility of arrest, and even of a faint resemblance to the process pursued in the obsolescence of ordinary tubercle. If it be true that cancer generally may retrograde, we may infer that what is true of the general, applies to the individual case. The reticulated cancer of Müller and phymatoid of Lebert are probably forms of regressive cancer. For a good account of the various forms of cancer arrest, reference is made to the work of Förster,† also to the observations of Cruveilhier on *Regressive Cancer*.

Notwithstanding the dictum of Rokitansky, experience shows that no natural or absolute antagonism exists between ordinary tubercle and cancer.‡ Both formations may coincide in the lungs. Lebert affirms that cancerous subjects become as frequently

* Op. cit., p. 619. † Op. cit., p. 92.

‡ Cruveilhier, t. v, p. 41.

tuberculous as others, but states that he has not observed the converse, that is, tuberculous to become the subjects of cancerous disease. Even this statement, however, must be taken with some qualification. Consult particularly that most interesting case by Bayle.* Another of the still more recent and well attested instances of the coexistence of the two diseases is recorded by Dr. Gordon.† Here numerous tubercles existed in the lungs, while large cancerous growth completely compressing the lung existed in the pleura. Many other instances are on record.‡

There may be doubt as to the actual conversion of tubercle and cancer; but with regard to the change or conversion of the scrofulous into the cancerous diathesis, one of the most convincing instances in my knowledge, recorded by a most able observer, under peculiarly painful circumstances, may be found in the writings of Pujol.§

Cancer of the Pleura. Primary and isolated cancer of the pleura is unquestionably an uncommon affection. Carswell inclines to the opinion that it is always the result of extension from some independent and primary focus; and this view of the distinguished pathologist is perhaps, as the rule, correct. The affection is generally observed associated either with cancer of the lung, mediastinum or pericardium, or is developed in the subserous tissue of the visceral or

* Op. cit., case 37.

† Reports of Dublin Path. Soc., February 7, 1863.

‡ Lebert, Sibley.

§ Op. cit., t. iii, p. 87.

parietal layers of the membrane, or results from the inward extension of cancer of the breast or bony structures of the chest, or upwards from extension of cancer of the liver and diaphragm. It must, consequently, be extremely difficult to indicate the pleura as the primary seat of the malady. When the pleura becomes affected with cancerous degeneration, it is usually in one or more of the following forms. First as minute spots scattered over or under the membrane, which have been aptly compared to drops of wax. At times, these drop-like spots present somewhat of a cracked surface; then resembling the patches of psoriasis guttata; at other times they probably coalesce and form the "plaques cireuses" of Cruveilhier, or large layers of cartilaginous hardness, as in the remarkable case by Richerand. In other cases, tubera of encephaloid or mixed form, either sessile and wart-like, hobnailed or pedunculated, arise on the free surface of the membrane. The latter polypoid form may, by augment, acquire all the importance of intra-thoracic tumours by growing free in the cavity of the chest, or fusing into the entire serous layers. Occasionally the pleura is generally and excessively thickened by cancer deposit, sending dense ramifications into the substance of the lung. Such induration of the visceral layer may, as has been before mentioned, induce general contraction of the lung by pressure, or the contraction may be limited to a given portion of the lung. A most interesting example of this latter form of contraction was recently exhibited by Dr. Gordon at the Dublin

Pathological Society.* The lower lobe of the left lung was almost entirely effaced by a hard scirrhous mass, which apparently had originally its origin in the pleura, but was now pressing upon the lung, obliterating the air vesicles, and spreading also, by various bands, into its substance. Section showed a very hard, striated growth of considerable size, which had rendered useless nearly the entire lower lobe of the left lung.

All these forms of cancerous degeneration may occasionally be attended with more or less abundant effusion, either simple, purulent or hæmorrhagic, into the pleural sac. This effusion may be either gradually absorbed, obliterating the cavity or not, or remain permanent, spoiling the lung tissue by pressure, or requiring, from the urgency of the symptoms, its removal by thoracentesis. Trousseau† has not only pointed out the occasional value of hæmorrhagic effusion as a means of diagnosis of the disease, but has also shown the palliative value of the operation alluded to. The thesis of Lacaze-Duthiers is quoted by Trousseau as replete with valuable cases. A singularly interesting case of cancer of the pleura, simulating phthisis, is recorded by Wunderlich.‡ There are also cases of tumour apparently originating in the pleural sac upon either side. A careful examination of these tumours goes far to prove that they may have originated in cancerous metamorphose of the effused fluid. Consult particularly

* Dublin Quarterly Journal, August 1863.

† Op. cit., i, 11.

‡ Op. cit., band iii, theil ii, s. 500.

upon this point the essay of H. Gintrac and the treatise of Zehetmayer. See also Commentary on Case 2.

Cancer of the Mediastina. Primary intra-thoracic cancer is exceedingly liable to invade the connective tissue and glands occupying the interspace of the pleural boundaries, anteriorly and posteriorly. The affection may occur in the form of isolated tubera of variable size, or in that of a compound growth gradually acquiring an enormous magnitude, as in the remarkable case of the Marquis St. Auban recorded by Boerhaave. More frequently, perhaps, the disease coexists with pulmonary cancer, or is a secondary result of external disease. The ordinary form may be simply scirrhous, encephaloid, or mixed. Rarely it assumes the form of colloid, of which Lebert has recorded a striking example.* Whatever the form assumed, the great practical fact is the tendency manifested by such growth to extreme development, and the production of the phenomena of centric or eccentric pressure. Anteriorly, bulging of the sternum and chest wall, with erosion of the solid structures and external development of tumour, distension of the fore part of the neck, by extension of growth, displacement of the mediastinum, crumpling up of the lung, flattening of trachea and bronchi, and extensive dislocation of the heart and vessels. Posteriorly, in addition to such displacement, pressure upon the lower part of the trachea and the main bronchi causing collapse of portions of lung and

* Virchow, Archiv. Band. iv.

occasionally gangrene of the lung from pressure upon the nutrient vessels; pressure also upon the large veins, nerves, and œsophagus, giving rise to various direct and reflex phenomena. Indeed, it is tumours, *par excellence*, of this description which, originating in so lax a matrix, become endowed occasionally with so fatal an attribute as that of indefinite extension, occasioning by far the most frightful symptoms of permanent and unmitigable chest anguish. This statement applies not only to true cancer, but to all other forms of tumour which invade the mediastina, and which cannot practically be disassociated from it, inasmuch as any mediastinal growth, whether fatty or fibro-plastic, exhibiting a tendency to indefinite expansion, virtually comports itself, by such characteristic, as cancer, and must practically be regarded as such. For although, in some rarer instances, death may result from the mere cancerous cachexia,* in by far the larger proportion, the fatal issue is determined by the distress induced by the pressure caused by the extension of the tumour.

Cancer of the Pericardium. Cancer of the pericardium, occurring as a primary affection, and limited, or nearly so, to this structure, is exceedingly uncommon. In the majority of the recorded cases, the disease appears to have extended either from the lungs or mediastinum, or has been the unmistakable result of secondary and general deposit. The form most ordinarily met with under such circumstances, is the medullary, either as tubera, vegetations, infiltrated

* Vide case.

layers, or polypoid growth. Simple scirrhus is much more rare. One well marked example is afforded by a case to which, and to its commentary, reference is made. Either form frequently, though not necessarily, determines effusion into the sac, simple, purulent, or sero-sanguineous. It is even possible that, in a strongly marked diathesis, intra-pericardial exudation may become the seat of cancer development. The case recorded by Bright* is interesting, as being attended with symptoms indicating irritation of the phrenic nerve upon the right side, which was found almost imbedded in the mass. Another most important case of this affection is quoted by Walshe† from Skoda.

Cancer of the Heart. Cancer of the heart, regarded in a special point of view, is omitted in this Essay. Primary and isolated disease of the organ is extremely rare; and the recorded cases require a much more careful analysis than has hitherto been made. The heart, however, is not unfrequently involved in secondary disease. The portion of the organ most commonly affected is the right auricle, which may even be perforated by the growth.‡ The chambers have been found affected in some exceptional cases. The disease has been met with both in the form of infiltration and tubera. Infiltration may occupy any portion of the muscular tissue—the pericardial surface, the mid-layer of muscle, or the innermost layer,

* Med. Chirg. Trans., vol. xxii. † Op. cit.

‡ Vide cases by Cruveilhier and Sims.

the latter form being associated with similar disease of the endocardial membrane. When the disease assumes the scirrho-encephaloid tuberous form, the greatest diversity prevails with respect to size and number of the tubera, which stand, of course, generally in an inverse ratio to each other. In a case recorded by Dupuytren, so numerous were the tubera, that the student charged with the task of counting them stopped when he had numbered six hundred.*

The *Arterial system*, as a rule, enjoys a remarkable immunity from the ravages of either primary or secondary cancer. Scarcely a well attested case is to be found.† The *Venous system*, on the other hand, is frequently found affected by cancerous disease. The disease may either extend from the auricle into the mouths of the large veins,‡ or may commence as an original affection upon their internal surface. According to Lebert, the most usual, if not the only way in which the disease affects the veins, is by spreading and destroying their outer coat, and pushing the internal coat forwards so as to form a kind of temporary investing membrane. Finally, rupture of the coat occurs, and the growth vegetates in, and fills the interior of the vessel.

Cancer of the Thymus Gland. There can be no doubt that this gland is, in rare instances, the iso-

* Cruveilhier, Anat. Path., t. v, p. 185.

† One instance, however, is cited by Cruveilhier.

‡ Cruveilhier, Sims.

lated seat of cancerous deposit. It is true that many of the examples recorded by the earlier writers, Bonetus, Haller, Lieutaud, and others, are to be received with a certain amount of distrust, from the very obscurity of their language. Henri Gintrac, however, in his Essay, refers to several more recent cases, in which, in all probability, the thymus gland was the seat of cancerous disease. Another, apparently conclusive case, is detailed by Mr. Falcon,* in which a large hæmatoid cancer existed in the original site of the gland of a man whose testicle had been removed ten years before. In this case, independently of the phenomena arising from the tumour, obstinate vomiting coexisted. In other cases, in which the testicle had been removed for cancerous disease, intra-thoracic cancer followed; a proof of the intimate sympathy between the thoracic organs and testes, pointed out by Hippocrates.† In one of Heyfelder's cases, the testes and epididymis were affected consecutively to the lung disease.

Cancer of the Brain and Cerebral Irritation. The implication of the nervous centres, either contemporaneously with or consecutively to intra-thoracic cancer, is of sufficient frequency to call for greater attention than has hitherto been given. There are many cases showing that deposit in the brain and irritation of the meninges play an important part in the cli-

* Op. cit.

† Si testium inflammationi tussis superveniat, inflammatio solvetur, et contrà.

nical history of thoracic cancer. Bayle* cites a case of Cayol, in which paraplegia, and subsequently apoplexy, ensued. After death, in addition to nodulated cancer of the lungs, a cancerous tumour the size of a turkey's egg, and of nearly spherical form, but of irregular surface, was found in the anterior portion of the right cerebral hemisphere. The tumour was non-encysted. The surrounding cerebral tissue was softened to the consistence of thick cream, but unchanged in colour. In the case observed by Morgagni,† in addition to effusion around the optic tract, it is probable that cancer of the pineal gland coexisted. Ponteau records a case, more fully alluded to under the section of Semeiology, in which simple irritation and convulsion, without appreciable organic change, existed. In the second case of Dr. Sims, there was much fluid in the subarachnoid tissue, and the arachnoid itself was more opaque than usual. In the third case of the same author, two tumours were found, one in the falx of the dura mater, the other in the pituitary gland. In the fourth case an extraordinary morbid change was observed in the pons Varolii. Another most interesting example is furnished in the third case of pulmonary cancer by Aviolat.‡ Here, in addition to cerebral symptoms, there existed marked alteration in the size of the pupils, the left being largest and least contractile. Cancer tubera, perfectly encysted, were found both in the cerebrum and cerebellum.

* Op. cit., p. 307. † Vide part i. ‡ Op. cit., p. 90.

Wunderlich* met with a case (and one greatly in point) of cancer of the pleura simulating phthisis and tubercular meningitis. After death, the arachnoid at its corneal portion was found very opaque, and crowded with small white granulations. The base of the brain and the brain itself were healthy.

Dr. Walshe records a most instructive instance of cancer of the brain, in his work on *Diseases of the Lungs*.†

The par vagum has been found in various conditions; sometimes softened and enlarged,‡ at others atrophied and lost in the cancerous degeneration.§ Bright noted change in the right phrenic nerve. The sympathetic nerve and ganglia may be pressed upon by cancerous mass, to the extent of causing alteration in size of the pupil.‖ This phenomenon was first pointed out by Dr. Macdonnell of Montreal,¶ in a case of intra-thoracic cancer.

The Œsophagus. Cancer of the lung proper may, as in the well known case by De Hahen, press upon this tube at its superior portion, and offer, by alteration of its position and by flattening, considerable impediment to the passage of the food. Another example of this mechanical dysphagia by pressure from cancer on the upper portion of tube, is recorded by Barère. A third instance of pres-

* Op. cit., b. iii, 2 abth., s. 500.
† P. 535.
‡ See case 1.
§ Op. cit.
‖ Pollock, Trans. Path. Soc., vol. xiv, 1863.
¶ McDonnell, op. cit.

sure upon the œsophagus, at its lower portion by mediastinal cancer, is recorded by H. Gintrac. In these cases, no actual extension of the disease to the œsophagus had occurred. Although primary cancer of the œsophagus may extend to and open into the lung, it is among the very exceptional results of primary pulmonary cancer to extend to and perforate the œsophagus. It would appear, however, that instances of even this complication are possible. For most important information on this subject, the reader is referred to the treatise of Köhler.*

In addition to the frequent coexistence of cancer in the solid viscera of the abdomen and pelvis, the omentum, mesentery, mesenteric glands, submucous and subserous intestinal connective tissue are found affected also. Aviolat discovered, in one case, numerous ulcerations of slight extent in the mucous membrane of the cæcum and ascending colon. He characterises them as non-cancerous changes, including them in the same category as the traces of congestion of the tract generally. This view, however, is open to question.

Etiology. The etiology of intra-thoracic-cancer is included in that of cancer generally. The same unknown remote conditions must be assumed to exist. Of cancer, as of other diathetic affections, it may be predicated, that the predisposing and exciting causes stand in an inverse ratio to each other with respect to their influence. The exciting causes

* Op. cit., s. 248.

would, probably, require to be of unusual and prolonged intensity of action for the development of cancer where no predisposition existed, and, conversely, where the predisposition is strong, exciting causes of comparatively slight intensity may determine an outbreak of the disease. It is a difficult, if not an impossible attempt, to pourtray the characteristics of the cancerous diathesis. The strumous and, perhaps gouty, diathesis, at least when strongly marked, acknowledges certain physical attributes, from which to infer a proclivity to disease. But, in cancer, no signs are manifest until the establishment of the cachexia which, too frequently, is but the reaction on the system of material change.

It would appear from the statistics of the affection, that neither age, sex, nor temperament enjoy any well attested immunity from the possibility of its ravages. It is, though rarely, observed at the very dawn of life; it also attends its close. Although more rife during the intervening period, it is not satisfactorily proved that either an active or a sedentary life, high or low living, or even pre-existent disease of the lungs, exercise any well defined influence over its development. *Inheritance*, a predisposing influence so great in the other affections named, is not found to operate with equal constancy in the development of cancerous disease. In only one instance I have had the opportunity of observing,* was its influence, to say the least, highly probable. Three brothers, descended from a gouty

* Vide case 1.

parent (whether the subject, also, of cancer, the family history is not sufficiently clear to state) were, equally, sufferers from gout. Two died of cancerous disease; the third (I believe still surviving), suffers from organic disease of the liver and gall stones.* Gout, rheumatism, and struma, have been too frequently noted among the antecedents of cancer, either as part of the family or personal history of the patient, to leave any reasonable doubt that the connection is not simply accidental. The exact correlation of these affections has yet to be determined. The writings of Ponteau,† Portal,‡ Recamier,§ and many modern observers,‖ show, conclusively, how frequently rheumatic and gouty affections either precede or coincide with cancerous disease. Ponteau adduces many instances, having directed special attention to the subject.

* Vide case 1.

† C'est néanmoins de ces désordres qui provient immédiatement de l'humeur gouteuse avec ses dépendances, humeur qui par sa cause et ses effets montre une assez grande affinité avec les levains cancereux. Si je ne l'ai jamais vu donner naissance à de véritables cancers, c'est que quelque nuances de différence entre la nature de deux humeurs changent bien le produit réel de l'un et de l'autre. Pourquoi enfin le vice cancereux attaque-t-il plus fréquemment les femmes que les hommes ? Pourquoi au contraire la goutte fait-t-elle plus de martyrs parmi les hommes que parmi les femmes ? Quelle distance sépare le rhumatisme de la goutte, les engorgements cancereux produit par le premier, et les tumeurs noneuses, plâtreuses, que laisse si souvent la seconde? Voilà une enigme dont je n'ai point le mot ; on perdroit peut-être son temps et ses peines à le chercher.—*Op. cit.*, t. i, p. 53, 59, 69, 73.

‡ Op. cit., t. i, p. 466 et seq. § Op. cit.

‖ Spath. Tumeur developpé dans la poitrine d'une vieille arthritique. Rust's Mag., etc., b. 45.

Finally, it can only be reasserted that, when the predisposition exists, the exciting causes may be as slight as various; a blow, or strain, cold, the *pathemata animi*, intemperate habits, suppression of some periodic discharge,* inflammation of the lung, bronchial membrane, or pleura, or, possibly, even the exudation thereby induced,† may, severally, become the starting points of cancerous degeneration.

The statistics of intra-thoracic cancer furnish the following results. From the cases analysed without distinction between primary and secondary disease, it appears that males are more frequently affected than females. Köhler states, though with some qualification, that of a total of sixty-four cases, forty occurred in males, and twenty-four in females. The male sex appears to be much more liable to primary cancer of the lungs than females. Of thirty-four cases, twenty-seven, nearly four-fifths, occurred in

* In several cases, minutely studied in their clinical bearings, the only obvious exciting cause was the suppression of a constitutional hæmorrhoidal flux. Boerhaave's case affords a singular exemplification of this fact. See, also, particularly, Pouteau, t. i, p. 53. Although the *post hoc, ergo propter hoc*, may not necessarily hold good, the alleged antecedent deserves consideration, and imparts a singular interest to the views of Hippocrates and Galen. These great observers thought that cancer was produced by some morbid element in the venous blood transmitted by the hepatic veins. Occasionally, this matter is excreted by the veins themselves, in the form of hæmorrhoidal flow. See Galen, by Daremberg, *Treatment of Cancer*, ch. xii, p. 781, t. ii, 1856. This ancient view is in direct harmony with that of a great modern pathologist, Cruveilhier. "Venous blood appears to me to play the principal part in the nutrition and development of cancer tissue. The internal membrane of the veins is the secreting organ of cancer juice." T. v, p. 165-6.

† Zehetmayer, op. cit., p. 138; Gintrac, H., op. cit., p. 10-16.

males, and seven, one-fifth, in females. In primary cancer, the right lung is most frequently affected. Secondary cancer is comparatively common as compared with primary disease.* The following tables show the comparative frequency of the disease at different ages:—

Walshe.		Köhler.	
1—20	3	1—10	1
20—30	8	10—20	4
30—40	7	20—30	9
40—50	9	30—40	2
50—60	11	40—50	10
60—70	5	50—60	3
70—80	1	60—70	5
	—	70—80	1
	44		—
			35

Aviolat.		Wunderlich.	
1—20	3	12	1
20—30	11	20	1
30—40	6	26—30	3
40—50	12	31—40	4
50—60	5	41—50	3
Above 60	2	51—60	4
	—	62	1
	39	72	1
			—
			18
		12 men; 6 women.	

Of the 44 cases in the tables of Walshe, 25 occurred in males, and 19 in females. Of the 40 cases in the tables of Aviolat, 21 occurred in males, and 19 in females. There appears to be some mistake in the statement of Aviolat as compared with his tables, which only yield a total of 39 cases.

* Op. cit., p. 632.

In ultimate analysis, Bayle found 3 cases of cancer in 900 examinations *post mortem* of phthisis. Heinrich and Popp found in 1121 examinations *post mortem*, 68 cases of malignant disease; of these 6, or one-eleventh, were cases of cancer of the lungs, simultaneous or secondary.

According to Louis, cancer of the lungs takes the fourth rank in the scale of comparative frequency of organs affected with cancer, viz., uterus, stomach, liver, lungs.

Duration. In the present imperfect state of the clinical history of intra-thoracic cancer, it is scarcely possible to state, with the necessary precision, the duration of the disease. Not least among the difficulties is the too frequent absence of information as to the precise commencement of the affection. Perhaps, in the majority of cases, the disease had existed some time before they became the subject of accurate investigation. Dr. Walshe estimates the mean duration at 13.2 months; the maximum at 27 months, the minimum at 3.5 months.

Modes of death. Although it is beyond our power to predicate the mode of death in any given case of intra-thoracic cancer, the following may be enumerated among the more common and immediate. Asphyxia, chronic or acute, induced either by acute miliary deposit throughout the tissue of the lung, or from the pressure of tumours in the posterior mediastinum upon the main bronchi, or from en-

croachment on the lungs by anterior mediastinal tumour, or from pulmonary congestion and œdema, sudden and extensive serous or sero-sanguineous effusion into the pleural or pericardial sacs, coagulation of blood in the pulmonary artery (Walshe), general disorganisation of the parenchyma of the lung, inducing extensive suppuration and gangrene. In protracted cases, death is, also, at times, the direct result of asthenia and exhaustion, or it may occur during slight convulsion.* Lastly, death may be immediately caused by hæmoptysis,† or actual suffocation has occurred from the sudden escape of pus from an excavation in the lower lobe of the left lung. The pus ascended above the bifurcation of the bronchi, and descended the right bronchus. This case had been mistaken for one of effusion into the pleura.‡

Local Symptoms of Intra-thoracic Cancer.

Pain. Although pain of most variable seat, character, and degree of intensity, is of very frequent occurrence during some period of the course of thoracic cancer, it certainly cannot be regarded either as invariable or characteristic. For the disease may run, throughout, a painless, or altogether latent course.§ When present, it may occupy some circumscribed region, or extend far and wide from hence along the head, neck, and arm of the cor-

* Vide case 6. † Vide case 7.

‡ Corvisart and Leroux, quoted by Gintrac, p. 20.

§ Walshe, op. cit. Hughes, op. cit., case 3.

responding side, or even downwards to the abdomen and inferior extremity. Usually limited to the diseased side, it may, in exceptional cases, extend to the opposite and unaffected side. It may be dull, deep, and fixed, unchanged in amount by pressure; or superficial, remittent, intermittent, lancinating, radiating, conjoined with excessive sensibility of the surface, and much increased by cough or movement. There is some difficulty in determining, with accuracy, the proximate seat of pain. It probably varies. It may be located, though rarely, in the parenchyma of the lung, more frequently in the sub-pleural tissue, or, as I believe, in the majority of cases, in the intercostal nerves. It may originate in these several structures either from direct pressure upon them from cancerous degeneration of the lung; from masses developed in the mediastina, or from cancerous irritation or inflammation of the parietal pleura, directly involving the nerves, or affecting them by continuous sympathy. In some cases, the altered constitution of the blood appears to be the exciting cause of neuralgic pain. The chief reasons for thus locating pain in the intercostal nerves are grounded, first, upon the special character of the pain—lancinating, radiating, and involving branches of contiguous nerves; second, the paroxysmal, and, at times, well marked periodicity of the pain conjoined with hyperæsthesia of the cutaneous nerves; lastly, upon the amount of benefit often temporarily obtained from the use of remedies serviceable in neuralgic affections.

Dyspnœa. This symptom has so wide a semeiological range, that it possesses, *per se*, but little value. It is from combination alone that it acquires a significance in intra-thoracic cancer. Like the preceding symptom it is observed of most varied type and character; at one time, of perverted rhythm, stridulous and laryngeal; at another, sibilant and pulmonary. Dyspnœa is, perhaps, sooner or later, almost uniformly present. Ordinarily, it is early, constant, and progressive, very rarely, markedly intermittent,* liable to severe paroxysmal increase, and, eventually, frequently entailing most agonising orthopnœa, momentary ease being obtained only by the most unusual positions. In many cases, the greatest amount of ease is obtained by bending the body forwards.

Its causes may be direct or reflex. Among the former may be enumerated:—

1. Spoiled lung tissue by ..
   - *a.* The actual disease.
   - *b.* Associate congestion, inflammation, suppuration, œdema.
   - *c.* Associate pulmonary apoplexy.
2. Direct pressure upon lung or bronchi by .....
   - *a.* Tumour near root, causing collapse.
   - *b.* Do. at periphery, either displacing lung or heart, or simply encroaching on lung tissue.
3. Direct pressure upon the nutrient arteries of the lung.
4. Direct pressure upon the pulmonary artery.
5. Coagulation of blood in the pulmonary artery and veins.
6. Effusion into pleural or pericardial sacs.
7. Direct pressure on intercostal nerves.

Reflex laryngeal or pulmonary dyspnœa may arise from,—

1. Pressure upon, or change in vagus or phrenic nerves.
2. The influence of impure blood.

* Snow, Journal de Progrès, t. xv, p. 236.

Cough. Like the dyspnœa, cough is of very frequent occurrence, though it does not necessarily increase with the latter. It is unattended by any special character. It may be of laryngeal, tracheal, or pulmonary type, and in character paroxysmal or constant. It may be caused directly by irritation of the lung tissue, or result from purely reflex action.

Expectoration. Most variable. It may be entirely absent; when present, simply catarrhal, scanty or copious, thin or viscid, milky white, muco-purulent, muco-sanguineous, or purely sanguineous,* currant jelly sputa affording a sign of value when present.† Lastly, detritus of softened tubera may be occasionally detected, either as white masses of caseous consistence, or as peculiar cells discerned by the microscope. The matter expectorated is, at times, remarkably fetid, possibly from gangrene of minute fragments of tissue. Mere fetidity, both of expectoration and of the breath, is, however, a very uncertain sign, being common to so many different conditions of the bronchial tubes,‡ and constitutional dyscrasiæ.

Voice. The voice is liable to modifications, depending either upon structural alteration of the larynx, or upon reflex nervous action. It may be

* Hæmoptysis is often observed. It may be more or less copious and recurrent; rarely directly fatal.

† Stokes, Hughes, Walshe.

‡ Vide Notes on Fœtid Breath in Diseases of the Lungs, by Dr. Laycock. 1865.

rendered hoarse, and nearly extinct, by congestion and superficial ulceration;* or cracked,† or the extinction of voice may exist without any sign of obstruction in the larynx, and without either stridor or dyspnœa, being dependant solely on paralysis of the laryngeal muscles consequent on pressure upon the nerves by the cancerous mass within the chest.‡

Palpitation, often conjoined with a sense of suffocation, fluttering and irregular action of the heart, is a frequent attendant upon intra-thoracic cancer. The various causes inducing it will be stated, with the physical signs, in the succeeding section.

Dysphagia. Is very frequently observed in cases of intra-thoracic cancer, resulting either from direct pressure, or from reflex action. No better example is recorded of dysphagia from the direct pressure of a scirrhous lung on the upper portion of the œsophagus, than the one already mentioned.§ In another instance the dysphagia was produced by the pressure of a cancerous mass upon the lower portion of this tube.‖ Another remarkable example occurs in case 6, allowing this to have been one of malignant disease. In other instances,¶ the phenomenon was evidently the result of reflex action. The case, narrated by Morgagni, is, also, in point.

* Vide Cases 1 and 4. † Vide Case 3.

‡ An instructive instance is recorded by Dr. G. Johnson, in his work on the Laryngoscope, p. 43.

§ Part i, p. 5. ‖ Jamieson, op. cit. ¶ Vide Case 1.

Physical Signs.

Intra-thoracic cancer, in some rare instances,* runs its course almost to the close, unattended by any marked objective phenomena. Such an exception to the ordinary course of the disease occurs where cancerous tubera of moderate size stud one or both lungs equably, leaving interspaces of lung tissue either healthy or but slightly emphysematous. In this particular, cancer resembles certain cases of tubercular deposit. More frequently, however, the ordinary methods of physical investigation detect certain abnormal changes of the thoracic and abdominal contents, the exact nature and value of which are to be ascertained, as Dr. Stokes has long since insisted upon, by a careful study of their combination and succession.

Inspection. The face, at times, is sad and anxious; occasionally œdematous, locally or generally; the alæ of the nostril are dilated, the eyes protruding, and the muscles of the face brought into unusual play. The complexion, at times, but little changed, or pallid, or flushed, earthy, lemon-tinted, or of a dusky, leaden cast slowly deepening almost to the veritable cyanotic hue. The lips, early in the disease, may, for a time, remain florid, but, in general, they gradually acquire a livid tint. The fingers are occasionally clubbed. The face and neck are often

* Vide Case 1.

swollen from simple congestion, or may commonly, either generally or partially, form actual serous infiltration; indeed, in some cases of mediastinal tumour, so great is the infiltration of the neck as to cause it to appear, as it were, padded. The arm and side of the chest affected are frequently œdematous. The veins of the head, face, neck, arm and abdomen may be greatly and permanently distended and varicose. In some veins, pulsation is now and then observed.* The chest may be altered in shape, becoming either flattened under the clavicles, retracted at its base, or preternaturally bulged, locally (from pure infiltration of the lung†) or generally. The abdomen may be unusually prominent in either hypochondrium, from dislocation of liver or spleen. Local œdema is, here, often present. The breathing movement is generally quickened, and undergoes various modifications. Its type may be altered, either to superior costal‡ or diaphragmatic. The rhythm may be prevented. The respiratory movement being unilateral, that is, limited to the unaffected side, all expansion movement in the opposite side arrested, simple elevation movement alone remaining, or a dragging motion of the scapula be alone perceptible. The visible site of cardiac impulse is, in some cases, much altered, the beat being visible under the right nipple.§

* Vide Case 2.

† Aviolat, op. cit., p. 49.

‡ In some rare cases, the diaphragm has been almost immobile, being encased in deposit.

§ Vide Case 2.

Palpation. The vocal fremitus varies. No certain rule can be laid down. It may remain unchanged when tubera stud the lung equably and rarely. It is modified, diminished, when extensive consolidation exists. Should extensive effusion be present, it is invariably annulled on the affected, and augmented upon the opposite side. Occasionally, rhonchal fremitus is felt. Quasi-peripheral fluctuation may be detected in some rare instances.* The cardiac beat is felt at the site of visible impulse, which may be, as above stated, far removed from the normal site. The impulse may be both systolic and diastolic, and apparently augmented in both force and extent from a layer of thickened tissue, or, weaker than normal. Irregularity of beat is, at times, distinctly perceptible. Purring tremor is, exceptionally, present, extending along the arteries. The pulse may be preternaturally small in both radials, when the mass presses upon the aorta, or feeble, or absent in one radial from pressure, limited to the innominate or subclavian artery. When the trunks are exempt from pressure, the pulse, as a rule, is weak and rapid. It usually augments in frequency as the disease advances; this rule, however, as usual, finds its exception. In the remarkable case recorded by Boerhaave,† notwithstanding the immense amount of disease and suffering, the pulse remained throughout unchanged in character. Intercurrent pericarditis may render the pulse unequal, weak and rapid, and weaken or annul the cardiac impulse.

* Vide Case 2.

† Op. cit.

Mensuration. By this method, slight though decided augment in respect of size of one side of the chest may be detected, occasionally, in the initial stage of infiltration of the lung tissue with cancer deposit. Woillez has shown that increased volume of the lung also occurs in the early stage of congestion and pneumonia. This assertion and that of increased volume in the early stage of cancer, made by Aviolat,* is in direct opposition to the experience of Dr. Walshe. The chest may, also, be enlarged, locally, to a greater or less extent by tuberous growth. Should the irritation of cancer deposit cause much fluid effusion into the pleura, general augment would naturally follow. In a later stage, when, from infiltration, contraction of the lung tissue occurs, or the pleural effusion has undergone absorption, mensuration shows the decrease in the circumference of the chest. This method of exploration possesses but little value. Inspection, perhaps, more than supplies its place.

Percussion. When cancerous tubera of moderate size are scattered scantily and equably either over the anterior face, or in the depths of one or both lungs, provided the intervening tissue be healthy or nearly so, percussion may fail to yield any positive results.† In other instances, the results obtained are those of negative character;‡ the same statement would, presumably, apply to cases of isolated infiltration of the lung tissue. But, in proportion to the regular or irregular growth of the tubera, or to the

* Op. cit., p. 49. † Vide Cases 1 and 3. ‡ Vide Case 5.

extension and coalescence of the infiltrated masses, or where a growth in the posterior mediastinum presses directly on a large bronchus, percussion elicits sensible modifications of thoracic resonance. Such modifications may range from slight and circumscribed, to the most extensive dulness, combined with the most marked sensation of tactile resistance. The maximum point of dulness and resistance may be circumscribed and correspond to the parts of greatest consolidation. It may be limited to the apex, base, or involve the entire side of the chest, and even encroach irregularly upon the opposite by displacing the mediastinum and heart,* and this may occur with exaggerated sonoriety of the healthy portion of the opposite lung; or the dulness and resistance may be limited to the precordial and mediastinal regions, and remain unchanged by alteration of position.* In rare instances, percussion, instead of being attended by a sense of tactile resistance, detects a sensible yielding of the underlying mass.† Should softening of the masses have occurred, it may be assumed, provided the cavern was moderately empty, that the percussion note would be tubular, and the phenomenon of the bruit de pôt félé developed, precisely as in cases of phthisical cavern. Where the simple irritation of the disease, or its origin in, or extension to, the pleura, has induced effusion into the sac, the percussion phenomena blend into those characteristic of such result. Independently of this, however, various changes in the quality of the percussion note

* Vide Case 4.

† Vide Case 2.

occur; now tubular, at another time tympanitic; and these modifications, determined by transient causes, are very difficult at times to appreciate correctly. Not unfrequently, co-existing œdema of the chest wall renders correct results from percussion unattainable.* Lastly, percussion may detect displacement of the liver and spleen.

Auscultation. Since percussion detects no alteration of the normal sonoriety of the lung in cases where but moderate deposit exists in the manner just alluded to, so, under the same conditions, auscultation equally fails in revealing any abnormal changes of the respiratory murmur.† But, when tubera increase in size, or infiltration invades a larger extent of tissue, or when tumour presses on a bronchus near its root, and causes either its partial or complete occlusion, auscultation then reveals corresponding changes in the breath sound. Such changes, ordinarily, consist of feebleness, gradually shading into more or less complete extinction of the natural murmur in the parts affected, while around, puerile, harsh or superficial breathing, or prolonged and harsh expiratory murmur can be heard. Or, the breathing may be hollow, blowing, bronchial or indeterminate, mixed with dry or humid râle, and the voice and cardiac sounds transmitted with unnatural clearness over the area implicated.

Should the cancerous deposit soften, and, subsequently, leave an excavation in the lung, the auscul-

* Vide Case 6. † Vide Cases 1-2.

tatory phenomena would, in nowise, differ from those which attend the process in ordinary phthisis. The same statement would, presumedly, apply to that most rare accident, rupture of the walls of a cancerous cavern, and escape of detritus into the sac of the pleura, giving rise to the phenomena of pneumothorax. Although one case* of such rupture has been recorded anatomically, it has never been clinically observed.

Cardiac and Vascular Phenomena. The heart is sometimes so displaced by intra-thoracic tumours as to bear the maximum point of sounds entirely away from the normal site.† But, notwithstanding such displacement, the sounds usually remain unchanged in character. They may, however, become singularly modified when cancerous tumours involve the anterior face of the pericardium.‡ This latter form of tumour can, also, accurately simulate the impulse of hypertrophy, as is shown in a case recorded by Dubourg.§ The intercurrent pericarditis, often induced by the extension of disease, reveals its existence by the ordinary phenomena. In addition to increased concussion impulse of the ventricle, pressure of cancerous masses upon the main trunks may determine all the varieties of impulse and murmur

* Cailliot, op. cit.

† Vide Case 2.

‡ Vide Case 4.

§ Hypertrophie du corps thyroïde; tumeur dans le mediastin antérieur donnant lieu aux symptômes d'une hypertrophie du cœur.—*Bull. de la Soc. Anat. de Paris*, p. 130. 1826.

usually detected in organic disease of the heart and great vessels.*

General Signs and Symptoms. The history of intra-thoracic cancer indubitably proves that the local symptoms aud signs, therein observed, are often insufficient for the purposes of diagnosis. The physician must, therefore, unless he possess a most rare and happy medical instinct, avail himself of those more general and indirect signs which, when existing, correct the negative results of physical examination.

The general surface may exhibit the characteristic straw or lemon tint, leaving the conjunctivæ of pearly blue, unless coexisting cancer of the liver has, in any way, produced obstruction of the biliary ducts.† This sign, often observed, is among the more important of the indirect class, and, when strongly marked, almost pathognomonic. Enlargement of the various absorbent glands of the neck and axilla subsequent to the advent of the thoracic symptoms, and greatly more important still, circumscribed swellings over the site of internal disease,‡ and the gradual development and growth of subcutaneous tubera,§ have afforded, so often, the grounds of correct diagnosis that the import of their presence cannot be overestimated. They have, more

* Vide papers by the author, "On Aneurismal Tumours involving the Neck", *Med. Times and Gaz.*, May 1863; also, text, diagnosis.

† Vide Cases 1, 3, 6. For a most interesting instance of the latter results, see a case by Dr. Graves, *Clin. Med.*, vol. ii, p. 61.

‡ Vide Case 2.

§ Vide Cases 3-8.

than once alone sufficed to reveal the nature of the chest disease, leaving auscultation still perplexed and doubtful. When widely scattered, they not only reveal the local malady, but indicate, unerringly, the constitutional contamination.

Dropsy, either local or general, is another frequent and most important concomitant of intra-thoracic cancer. It may arise from several causes. First, from direct pressure upon the great venous trunks.* Should such pressure obstruct the current through the pulmonary veins, congestion, hæmoptysis, œdema of the lungs, and hydrothorax may result. When the obstruction is seated at the cavæ innominatæ, or subclavian veins, general or partial dropsy occurs; second, effusion into the peritoneal sac may occur from simultaneous or secondary deposit of cancer in the abdominal organs. Independently, however, of extensive obstruction to the venous circulation, circumscribed dropsy of the surface of the chest, arm, face, or abdomen, where cardiac and renal disease can be eliminated, is a most significant sign, being the direct result of adhesive phlebitis and coagulation of the blood caused by the presence, in the veins, of cancer poison. Lastly, dropsical effusion occurs in these cases as the direct result of the alteration of the standard composition of the blood.

* Not dropsy alone, but actual gangrene of the extremities, may be produced by the pressure of a cancerous mass upon the aorta and cava, completely obstructing the circulation. See a paper by the author, "On Spontaneous Gangrene connected with Disease of the Heart and Great Vessels", *Medical Mirror*, June 1864, p. 323.

Engel* is of opinion that cancerous masses continually abstract the albumen of the blood, in order to maintain their nutrition and growth, and that the general dropsy, so commonly observed in cancerous disease, results from this constant abstraction, from the blood, of an element so necessary to its standard density. However this may be, the dropsy of cancerous cachexia remains an indisputable fact.

Debility and unaccountable Languor are usual attendants upon intra-thoracic cancer, and supervene, frequently, at a comparatively early stage of the disease.

Emaciation, though considerable, is, in general, hardly so marked as in phthisical disease, unless abdominal cancer, immediately impairing nutrition, coexists.

The Digestive Functions are, as a rule, considerably deranged. Dyspeptic symptoms, nausea, bilious vomiting, coated tongue, thirst, anorexia, distension, diarrhœa and griping pain being very generally present.

Fever, moderate in degree, and often of hectic type, is another leading symptom of the disease. The nocturnal exacerbation is followed by profuse perspiration. Indeed, so far as I have observed, the perspirations are in some cases quite as violent as those which occur in phthisis.† They may be general, partial, and in some cases strictly unilateral.‡

Cerebral Phenomena. Disturbed cerebral functions so frequently coexist with intra-thoracic cancer as to

* Op. cit. † Vide cases. ‡ Part i, p. 27.

render their study, under such association, deserving of much more careful attention than has hitherto been devoted to them.

Such disturbance may arise either from mere sympathetic irritation, or from actual textural changes in the brain and its membranes.

The case narrated by *Morgagni* has already been alluded to.* Here, however, the pineal gland was probably the seat of cancer, as its unnatural size attracted the attention of all present at the autopsy. A remakable case, apparently, of sympathetic irritation of the brain, resulting from the presence of intra-thoracic tumour, is detailed by *Pouteau.*† A little boy, three and a-half years of age, had been gradually losing health for three months. Suddenly he was seized with violent headache, associated with convulsive movements distorting the features. Circumscribed redness, limited to the left cheek, induced the narrator to institute inquiries respecting the state of the chest. After an interval of calm the pain and convulsions recurred with such violence and duration as to cause death in twenty-four hours. The most minute examination after death failed to detect the slightest disease either in the brain or its membranes. In the lower lobe of the left lung, however, a tumour was found, irregular in shape, about the size of an ordinary hen's egg, of white colour, and of the consistence of tallow. The remaining portion of the lobe was sound, as, also the upper lobe. There was no adhesion of the pleura.

* Part i, p. 7.

† Op. cit., t. i, p. 461.

In the second and fourth cases of Dr. Sims,* hemiplegia and marked cerebral symptoms supervened upon pulmonary cancer of some years standing. Perhaps, one of the most interesting examples of cerebral irritation and disease, consecutive to cancer of the pleura, is that recorded by Wunderlich.† The case, so far as regarded the symptoms and physical signs, was for some time regarded as one of phthisis in the cavernous stage, and the cerebral symptoms subsequently supervening were regarded as those of tubercular meningitis. The *post mortem* appearances have been already detailed. Two most important cases of intra-thoracic cancer with cerebral symptoms, and one of supposed phthisis, are recorded in the thesis of Aviolat.‡ In the first case, in addition to inequality of the pupils, partial loss of consciousness, followed by vomiting, occurred on two occasions. In the second case, supposed to be one of phthisis, in addition to cephalagia, hearing was impaired, speech difficult, and double vision occurred with slight strabismus of the left eye; the left pupil was, for a time, larger and more sluggish than its fellow. Hallucination also existed.

In some cases attacks of wandering erysipelas have been noted, and, when present in any doubtful case, are not devoid of significance. Rheumatic pains have also often been observed prior to the immediate explosion of the chest disease.

Of these general signs many may be absent in any given case. Even when the majority exist, they

* Op. cit. † Op. cit., p. ‡ P. 87.

possess unequal degrees of value. Some afford highly presumptive proof of the existence of cancerous cachexia, while others are shared in common with allied diseases. One indirect sign may correct the doubtful or negative results of physical exploration, while the coexistence of two or more, conjoined with physical signs, renders the evidence for the existence of intra-thoracic cancer scarcely less than demonstrative.

DIAGNOSIS.

The art of distinguishing one disease from another bearing a more or less close symptomatic resemblance, is, or ought to be, based upon a minute and accurate acquaintance with the clinical history of the diseases intended to be compared. Whether our knowledge of intra-thoracic cancer accords with the definition, that is, whether it is, at present, sufficiently comprehensive ; whether we really do include aright and exclude aright ; or, whether theory has not run somewhat ahead of practice, are matters still open to question.

" *O ! quantum difficile dignoscere morbos pulmonum ; quantum difficilius eos sanare*," exclaimed *Baglivi.* His words have echoed on even to ourselves despite the the aids furnished in the department of physical diagnosis, and we never, probably, feel more sensible of their truth than when dealing, practically, with the subject of cancer of the lungs ; since, certain it is, that singular oversights occasionally occur with

respect to this disease, even to those disciplined in the practice of auscultation. Nothing, seemingly, would either better show the necessity of a wider induction, or more plainly prove how difficult it is, at times, to decipher, even with the assistance of the stethoscope, the faulty workings in the interior of the chest, and to interpret aright the nature of some nascent or established change.

If all the signs and symptoms detailed in the preceding section, even though a mixture of accidentals and essentials, co-existed in any given case, there might, probably, exist small room for doubt as to the precise nature of the lesion. But such a combination, unluckily, rarely or never occurs. Some of the symptoms regarded as characteristic may be entirely absent; others, of varying significance, may be developed only during the progress of the disease. So that it is obvious there may be considerable risk of confounding intra-thoracic cancer with several very different affections of the chest, unless we most carefully watch for, and note, the advent and progress of these later manifestations with a view to obtain the full complement of phenomena required for the purpose of differential diagnosis.

The affections liable to be confounded with cancer, ranged in the order of their comparative frequency, are, chronic pleurisy, aneurism, phthisis, pericarditis, cancer of the liver, chronic pneumonia, relapsing bronchitis, hepatic disease, hydatids of the lung, Corrigan's cirrhosis, strumous glands in the mediastina, mediastinal abscess. There are one or two

other sources of difficulty, but of such rare occurrence as to be safely pretermitted. No attempt is made to distinguish, clinically, between the two forms anatomically demonstrated, tuberous and infiltrated cancer, not only from their very frequent co-existence, but also (unless in exceptional cases) from the similarity of the physical signs and symptoms. In both of these forms all physical phenomena may, though rarely, be temporarily or permanently absent.

Chronic Pleurisy. The majority of writers upon the subject of intra-thoracic cancer have indicated chronic pleurisy as the affection, *par excellence*, most likely to infuse a disturbing element into the question of diagnosis, and our most recent experience fully confirms the wisdom of the caution. No wonder, consequently, that they have detailed, minutely, those physical signs and symptoms which are to guide us in the solution of the problem. It is, however, undeniable, that in many cases mere physical diagnosis is utterly incompetent to decide the question, inasmuch as chronic pleurisy constitutes, in itself, an integral part of the natural history of intra-thoracic cancer. Effusion into the pleural sac may and does occur, at times, at a very early period of the disease, when cancerous tubera stud the periphery of the lung, just as the presence of phthisical tubercles may determine effusion at any period anterior to that of softening. Now, we are never enabled, in any given case, to determine, *à priori*, what underlies the effusion of chronic or latent pleurisy—it may be a simply car-

nified, a tuberculous, or even a cancerous lung—no mere examination of the chest can possibly decide when its cavity is moderately and equably filled with fluid. It is asserted by Aviolat,* that in simple effusion the infraclavicular sound is generally normal, often exaggerated or tympanitic, but that this character fails in cancer of the upper lobe of the lung. Were this modification even constant, it would not be a distinctive one between cancer and tubercle. But, setting the point aside, there are very many cases of effusion associated with great density of false membrane, in which the affected side is uniformly dull and resistant to percussion. We must adopt a simple calculation of probabilities; considering the very great comparative frequency of simple or tubercular effusion and the rarity of effusion induced by cancer, we are, practically, safe in excluding the latter affection unless indirect phenomena supervene. Should external cancer be present,† or the axillary

* Op. cit., p. 61.

† Even when the effusion is consecutive to external cancer, we may not always infer such effusion to indicate, of necessity, the existence of internal cancer. The following remarks upon this occurrence are borrowed from one of the greatest authorities upon the subject of cancer.

"If the subject of cancer has suffered some time before death from oppression, cough, and pain in the chest, we are not, as a necessary consequence, to expect to find cancerous degeneration of the lung, but, much more likely, pleurisy, pneumonia, serous effusion in the pleural sac, or adhesion of the pleural surfaces. The propagation of cancer from the exterior to the interior is more frequently inferred from the symptoms, than confirmed by the autopsy. When internal cancer is observed in subjects who have succumbed from mammary cancer, it is almost always in organs remote from the external disease. Under such

and cervical glands enlarge and harden, or subcutaneous tubera develop, or the chest veins become varicose, or local dropsies arise, or unusual thoracic pain be present, or hæmoptysis, or signs of centric pressure arise, and feverishness and marked change in the complexion, we are then to consider whether the lung or pleura is not *ab origine* the seat of malignant disease.

One other indirect sign has been signalised by *Trousseau*,* as occasionally valuable in determining the nature of the lesion. Supposing, that in a case bearing the semblance of chronic pleurisy, a necessity should arise for the operation of thoracentesis, and that the fluid evacuated should contain any considerable amount of blood, such a peculiarity is to be regarded as probable evidence of the existence of cancer of the pleura.†

There is one source of embarrassment, though of rare occurrence, which I may allude to here. An encephaloid intra-thoracic tumour may be of so diffluent a nature as to distend the chest wall and yield a most delusive sense of fluctuation. For further remarks upon such a condition, the reader is referred to Case 2.‡ Nor must I omit to mention the difficulty of diagnosis now and then occasioned by circumscribed pleurisy bounded by very dense false membrane, and distending the chest wall.

circumstances, we have frequently found cancerous masses in the liver and other abdominal organs."—Cayol, *Mal. Cancereuses*, p. 312; *Clinique Medicale*, 1833.

* Op. cit., t. i, p. 669.

† Consult, also, a remarkable case by Zehetmayer, op. cit., p. 341.

‡ Vide case in which Bowditch punctured. Gairdner, *Clinical Med.*, p. 719.

Chronic Pleurisy, with contraction of the chest wall. Should any doubt arise under such a condition, its solution would be assisted, first, by a most careful investigation of the history of the case; and, secondly, by the study of its progress. If severe and constant, or radiating paroxysmal pain be present, well-marked signs of centric pressure, relapsing pleurisy, local or general dropsy, varicose chest veins, a yellow or livid complexion, or tubera or glandular enlargements develop, they would constitute the strongest grounds for suspecting the existence of cancer.

Dr. Walshe considers that, with such retraction, the normal position of the shoulder, spine, and scapula distinguishes cancer from the results of simple pleurisy. But, when we consider how frequently pleuritic effusion attends intra-thoracic cancer, such ground of distinction is, probably, open to doubt. Hæmoptysis, even with retraction of the chest wall, is a doubtful diagnostic sign, *per se*, and only acquires special significance when co-existing with the signs enumerated.*

Aneurism. To distinguish intra-thoracic cancer from aneurism is not, at times, an easy task. Two cases† are detailed illustrative of the proposition. In the one, the subsequent development of subcutaneous tubera cleared the doubt; in the other, a most deeply interesting case, as no post mortem examination could be obtained, the reader must draw his own conclusion. I can only guarantee the care and faithfulness of the narrative. It will, of course, be appa-

* Vide last case of the series. † Cases 3 and 5.

rent, that no difficulty can arise in ordinary cases in which a well-defined external and circumscribed pulsating tumour is observed corresponding to the course of the trunks; the difficulty offers in that less-defined class of cases where, with signs of lung irritation, percussion dulness, diffused pulsation, abnormal sounds over the track of the main vessels, and want of equality and synchroniety in the radial pulse; the signs of centric pressure are also more or less developed. Under such a difficulty even we dare not always rely upon the alteration in size of the pupil, so sagaciously pointed out by Professor Gairdner as calculated to assist us in a doubtful case of chest disease. In cancer, as in aneurism, irritation of or pressure upon the *par vagum* may induce paroxysms of laryngismus, hoarse or cracked voice or dysphagia; * so, also, may the irritation or pressure of either disease, exercised upon the sympathetic nerve, induce the alteration of the pupil adverted to.†

For the detail of a most important case in which intra-thoracic cancer was mistaken for aneurism and the treatment of Valsalva adopted, reference is made to a case by Gordon; ‡ also to another case by Martin-Solon,§ in which percussion dulness existed over the precordial region accompanied by blowing murmur and purring tremor; the respiratory murmur gradually ceased over the left lung; the exist-

* See particularly case 1.

† See case by Dr. Pollock, *Trans. Path. Soc.*, viii, 1863. The alteration in size of the pupil, in cases of pulmonary cancer combined with cerebral symptoms, is alluded to under the head of General Signs.

‡ Op. cit., p. 12.

§ Op. cit., p. 142.

ing dyspnœa was relieved by inclining the body forwards; dysphagia, also, existed to such an extent as to render the passage of food down the œsophagus impossible. The case from Cruveilhier has been already alluded to.* A suspicion of aneurism, also, was excited in one case recorded by Dr. O'Ferrall, and in another (Case 5) by Dr. Kilgour.† It may not be inopportune in this place to direct the attention of the surgeon to the case recorded by Cayol.‡ A watchmaker of Paris had a hard and painful swelling near the left shoulder, in which strong, excentric pulsation existed, synchronous with the pulse. Many of the most celebrated surgeons of the capital, including Sabatier, examined the case, and unanimously pronounced it to be one of aneurism of the subclavian artery. The treatment of Valsalva was, also, here adopted. Post mortem examination revealed the existence of cancer. Several other instances might be cited, but the above, recorded by good observers, are sufficient to show the practical difficulty of the subject.§ It is only by the application of the rule laid down by Dr. Stokes, viz., that of studying the combination and succession of the symptoms, that we can hope to obtain an ultimately accurate diagnosis.

Phthisis. Intra-thoracic cancer, not unfrequently,

* Part i, p. 21.

† Monthly Journal, p. 508, June 1850. ‡ Op. cit., p. 484

§ Even at the *autopsy*, cancer has been mistaken for aneurism, as in the case recorded by such great authorities as Laennec and Cayol.—Cayol, *Clin. Med.*, p. 483.

wears the mask of phthisis, and, how closely, may be seen by the perusal of cases 1 and 5. This important fact is, also, noted by other observers. The third case, by Aviolat,* is directly in point. Other cases are recorded by Gordon† and Wunderlich.‡ This affection may not only bear the closest resemblance, so far as regards the general symptoms,§ and the ordinary signs of pulmonary condensation, and local retraction of the chest wall, but such resemblance may obtain even at the stage of excavation of the tissue. No mere results obtained from physical investigation would guide us under such an embarrassment. The same site of morbid change, the same tubular percussion note, the same cavernous breathing, the same gurgling râle and whispering echo.‖ In short, the diagnosis would be only possible by the presence of those invaluable general signs alluded to before. A most interesting case, and one most opportune, is recorded by Cailliot,¶ in which not only did cancerous cavern exist at the lower third of the lung, but its walls actually gave way, allowing both blood and cancer detritus to escape into the cavity of the pleura, without doubt, evoking all the physical phenomena of hydro-pneumo-thorax.

This view makes no unfair demand on our belief, when we remember that cancerous tubera may stud the lung in the same manner as that pursued by

* Op. cit., p. 85. † Op. cit. ‡ Op. cit.

§ Abdominal cancer, even, may simulate the rational signs of phthisis. —Portal, case, 1780.

‖ Vide case. ¶ Op. cit.

ordinary tubercle, leaving islets of tissue more or less healthy; also that these tubera may aggregate and soften, leaving the portion of the lung burrowed precisely as tubercles do. I have the most perfect assurance that further observation will support me in this opinion respecting the resemblance between cancer and phthisis.

Subacate or Chronic Pericarditis. When intra-thoracic cancer is limited to the anterior surface of the pericardium, there are obvious difficulties in the way, at times, of any attempt to distinguish it from chronic pericarditis with excessive deposition of false membrane. Indeed, pericarditis is frequently a complication and direct result of the cancerous disease.

Case 4 affords a well-marked example of this form of the disease. Its commentary must be referred to, to see in what special particulars it appeared to me to differ from simple affection of the pericardium.*

A case is recorded by *Baron*,† in which the symptoms induced by tumours, involving the anterior mediastinum, and posterior surface of the pericardium, were regarded as the result of hydro-pericarditis, and a corresponding treatment adopted. There existed great dyspnœa, increased on mounting a stair, occasional cough, accompanied by mucous expectoration, decubitus on the left, impossible on the right side, the pulse feeble, small and unequal,

* In the same commentary, the attempt is made to point out the difference between cancer of the pericardium, *mediastinal abscess*, and *enlarged strumous glands in the mediastinum.*

† Medical Repository, vol. xxxi, p. 423.

increased in frequency towards evening, when feverish excitement supervened, flushed and swollen cheeks, distressing dreams, and sudden starting from sleep. The physical signs present were, bulging of the precordial region, œdema of the corresponding surface, substernal and dorsal pain, cardiac impulse very distant and almost imperceptible. Dr. Walshe* has, also, adverted to a remarkable case in the practice of Skoda. This latter practised observer had diagnosed the existence of hydro-pericarditis, and recommended the operation of paracentesis. The sequel proved the case to be one of intra-thoracic cancer.

Chronic or Interstitial Pneumonia and Cirrhosis of the Lung are said to resemble intra-thoracic cancer in certain particulars. Existing, beyond doubt, as separate entities, it must be borne in mind that the changes anatomically characterising them, form, also, part of the textural changes common to a cancerous lung. Existing separately, they are, avowedly, rare conditions, with scarcely yet a well-known clinical history. This very imperfection would disqualify them for purposes of accurate comparison. My own experience does not supply me with the requisite data for even attempting to lay down rules for differential diagnosis. I must, therefore, refer the reader to the text-books stating the distinctive peculiarities.† In any doubtful case, signs of centric pressure, dropsy, and the existence of violent pain,

* Treatise on Cancer, p. 366.

† Walshe, op. cit., p. 540.

more or less persistent, would render the existence of cancer probable.

Dr. Stokes has shown that cancer of the lung may commence with the ordinary signs of *bronchitis*. The frequent recurrence, however, of this affection, without adequate exciting causes, and the obstinate resistance to ordinary treatment, the gradual condensation of portions of the lung, the hæmoptysis, and, sooner or later, the supervention of other indirect symptoms, will excite suspicion of some unusual affection of the tissue of the lung.

Hydatid or Simple Cysts. These organic or simple structures occasionally developed within the cavity of the chest, may encroach so much upon the lung tissue as to create much difficulty with regard to diagnosis, opinion inclining, in some cases, to phthisis,* in others to cancer. Several instances are on record. One of the most instructive of the class is recorded by Alibert,† and quoted by Henri Gintrac in his Essay on Intra-thoracic Tumours. The symptoms and physical signs resembled as closely those of a solid tumour, as of a hydatid cyst. The patient, æt. 31, had complained upwards of ten years of a constantly increasing pain in the right side of the chest, attended with dry cough and dyspnœa. Decubitus was easiest upon the right side. This side of the chest was more prominent than the left. Percussion yielded a dull sound in front below

* Trousseau, op. cit., t. ii, p. 563.

† Journal Hebdom., t. ii, p. 264, 1829.

the fourth rib, and the respiratory murmur was absent in this situation, while on the left side it was puerile. The heart had an abnormal inclination towards the left. The pain suddenly became more severe, the dyspnœa more intense, and the anxiety extreme. Dulness on percussion now extended over the pericardial region, the action of the heart became tumultuous, and caused a sound resembling that produced by tearing a very dry piece of paper. On *post mortem* examination the remains of a large hydatid cyst were found, which had burst into the pericardium. Under such circumstances an accurate diagnosis of the hydatid disease, during the earlier stage, would have been impossible, unless the organic contents of the cyst had been actually expectorated. Trousseau records two other examples of hydatids in the lung, observed by Vigla and Mercier, which might readily have been confounded with either phthisis or cancer. Another example of a very large simple cyst developed between the pleura and the chest wall is detailed by Haller.* Lastly, as proof of the extreme difficulty, at times, experienced in the diagnosis of this disease, the remarkable case recorded by Dr. Gairdner,† must be most carefully perused. Opinion wavered between phthisis, cancer, and "a peculiarly placed pleuritic effusion." Microscopic examination of some very peculiar membranous shreds expectorated, finally permitted Dr. Gairdner to venture on the diagnosis of hydatid disease of the lung.

* Op. cit.

† Clinical Medicine, p. 430.

Cancer of the Liver. When cancer invades the liver generally, it is well known that this organ acquires, at times, an extraordinary augment, both in respect of size and weight, and greatly lessens the area both of the thoracic and abdominal cavities. It happens, however, occasionally, that the deposit more immediately involves the convex and superior portion of the right lobe of this organ, and exhibits a more marked tendency to upward than to downward extension. Under such circumstances, the liver encroaches mainly upon the right side of the chest, enlarging its circumference, eliciting the most marked percussion dulness, and eventually inducing irritation of the pleura, lung, or even pericardium, either by direct pressure, or by continuous extension of the primary disease. In this manner are frequently produced all the signs and symptoms of inflammation of these organs, with coexisting œdema and bronchitis. Such results are well exemplified in the cases of Littré, Heyfelder, Andral, Cruveilhier, and Frerichs.* Under

* The following case occurred in the practice of Dr. H. Llewellyn Williams, of Leonard Place, Kensington, formerly Surgeon to the East York Militia, who has favoured me with the particulars from the Hospital Case Book :—

"Thomas O'Hara, aged 29, admitted into Hospital, April 5th, and died April 11th, 1854. Eleven years ago he enlisted in the 15th Foot, and served two years and eight months in Ceylon, where he had jungle fever and jaundice. He was invalided home, and on his arrival remained under treatment for relapses of fever and dropsy for some months, and then received his discharge. He enlisted in the East York Militia in October, 1852, at which time he presented the appearance of good health ; and beyond some scars of leech bites and cupping on the right side, no one would have imagined anything had been amiss with him. His height was 5 feet 11 inches, weight 11 stone 2 lbs. He was called up for training in the May following his enlistment ; and, the regiment being em-

these complications, almost insurmountable difficulties may arise in the way of mere physical explora-

bodied, he had again to undergo the regular duties of a soldier, with the disadvantage of being quartered in billets, as there were no barracks for the accommodation of troops in the town. Since his discharge from the army, O'Hara had been very temperate until the early part of the year 1854; he at this time, on several occasions, partook freely of gin and beer. On April 3rd he first experienced pain in the right hypochondrium of a lancinating character, and slight cough; towards night he had a rigor, the next day, the pain still continuing and the cough being rather increased, he was reported sick. At night he again had rigor and became delirious; on the 5th he was brought into the Regimental Hospital under my care. At this time his symptoms were—great heat and dryness of skin, urgent thirst, nausea, the tongue coated with a yellowish creamy covering, urine scanty and high coloured, pulse 92, respirations 28 per minute. He complained of violent pain in the right side below the ribs, extending upwards to the scapula, his sufferings were considerably aggravated by the cough. There was nothing abnormal at the upper part of either right or left lung; but at a point commencing from the right nipple there was a considerable dulness on percussion; posteriorly, fine crepitation was audible. The liver could be felt considerably enlarged, or rather pushed out of its place; the abdominal muscles were very rigid, particularly on the right side.

It was evident to my mind that the man was suffering from pleuropneumonia, with effusion. On the day following his admission the conjunctivæ were very yellow, indicating some implication of the liver; the bowels were constipated at first, and when they were relieved there was evidently no bile in the secretions.

The chest symptoms gradually progressed, and he sunk from exhaustion on the morning of the 11th, having for some hours before death suffered from diarrhœa, but with no appearance of bile in the evacuations, though for some days bile had been passed in the urine.

Post mortem thirty hours after death.—The body was that of a well-nourished man. The entire skin was strongly stained with bile. On opening the thorax there was seen in the cavity a large quantity of bloody serum (nearly two pints). The heart was slightly hypertrophous, somewhat pale in colour, the valves healthy. The lungs on both sides were bound down by strong pleuritic adhesions; on the right side they could not be separated without the aid of the knife. There was some considerable quantity of pus in the right pleura; the upper portion of

tion. The diagnosis must, consequently, be aided by a careful study of the antecedents and concomitants of the case. In hepatic cancer, there are often existing, in greater or less degree, peculiar phenomena of abdominal type more or less characteristic. Hypochondriacal and dyspeptic symptoms of some duration, especially anorexia and vomiting, are mostly present, with occasional uneasiness in the region of the liver. Cruveilhier considers abdominal meteorism a valuable sign. Jaundice and high-coloured urine may, at times, coexist. Abdominal dropsy and symptoms of localised peritonitis often appear at a comparatively early stage. Should effusion be limited in quantity, some enlargement and irregularity of the surface of the liver may often be detected by palpation and percussion. Pain in the right shoulders or hip, when present, is not without significance.

Abscess in the upper lobe of the liver has been occasionally a source of the greatest embarrassment with regard to diagnosis.* The same statement, of course, holds true of hydatid cysts.

the right lung was emphysematous ; the entire remaining portion of the organ highly congested, the lower part infiltrated with pus and breaking up readily with the finger. A tumour, the size of a large orange and of the consistence of brain, sprung from the liver, and after perforating the diaphragm and pleura with which it had contracted adhesion imbedded itself in the substance of the lung.

I regret to say that no microscopic examination was made, but I concluded the mass to be malignant. I should add, that this mass was deeply seated in the right lobe of the liver, and could only with great difficulty be separated from it. The jaundice observed during life, and the absence of bile in the evacuation, I suppose to have been owing to the pressure of the tumour on the duct.

* Mercier, Hydrothorax, 1810.

Prognosis and Treatment.

The difficulties of diagnosis once surmounted, how little can be said respecting either the prognosis or treatment of a disease which, being inevitably fatal, restricts all interference of art to measures of simple palliation.

Intra-thoracic cancer differs, signally, from the diseases with which it has been compared. Some of these may undergo a resolution more or less complete; others, albeit of fatal tendency, exhibit varying periods of activity and repose, or, from the employment of judicious measures, admit a long postponement of the issue. This pursues no halting course, but ever advances, *pari passu*, on to death. Hence, in our use of various therapeutic agents in succession, we are warned of the narrowing limits to their power: "Quem servare nequeas ne noceas."

The principal symptomatic or palliative indications are:—

1. To lessen the irritation, distension, inflammation, and œdema, caused by local disease or pressure, or the more remote congestion and its accidents such pressure may determine.

2. To relieve simple pain, constant or paroxysmal.

3. To relieve cough and urgent paroxysmal dyspnœa.

4. To arrest hæmoptysis or profuse nocturnal perspirations.

5. To avert the immediate peril arising from excessive effusion into the pleura or pericardium.

The attempt to fulfil these several indications is to be made by small topical bleedings, dry cupping, blisters, belladonna and aconite frictions or plaisters. Internally, by aconite, belladonna, stramonium, either singly or combined. In cases attended by excruciating pain, I think I have found extract of aconite more successful than any other remedy. Occasionally, when the pain is markedly periodic, large doses of carbonate of iron and quinine have been of signal service, showing how largely the neuralgic element is involved. When the paroxysms of dyspnœa are urgent and prolonged, the cautious inhalation of fifteen or twenty drops of chloroform rarely fails to lessen their intensity. But, under ordinary circumstances, the ordinary combination of chloric æther, ammonia, and morphia may be prescribed. During the closing stage, when the anguish is, at times, of fearful intensity, morphia, in frequent doses, is indispensable, with the direct intention of favouring the euthanasia. Where colliquative perspirations produce exhaustion, benefit will, I have reason to believe, often be found in the combination of ergot of rye and oxide of zinc; cod-liver oil has been prescribed in these cases, though, considering the nature of the disease, it is difficult to determine upon what principle the recommendation is based. No injury can possibly attend its administration provided it be easily tolerated. Lastly, the operation of paracentesis of either pleura or pericardium may at times be necessary to avert impending suffocation.

CASES AND COMMENTARIES.

Case I.

ENCEPHALOID CANCER OF THE LUNGS SIMULATING LARYNGEAL PHTHISIS.*

The history of cancer of the lungs still remains so avowedly imperfect, that each individual observation carefully recorded must possess a value by contributing to fill up the existing deficiency.

The subjoined case presents many points of interest :—

Mr. ——, aged 64 years, of middle stature and nervous temperament, an accountant by profession, had enjoyed an average share of good health to within a period of two years preceding his decease. His habits were temperate and regular; and he was capable of attending to his professional duties until within a few weeks of his death. The only important commemorative is, that he had lost a brother a short time before from well-marked encephaloid disease.†

In the middle of the year 1853, Mr. —— suffered from the follicular affection of the throat long known to French pathologists, and of late, perhaps, brought into a somewhat undue prominence. The uvula was hypertrophous; the tonsils large; and the mucous follicles of the fauces were largely developed. His cough was

* Association Medical Journal, Nov. 3rd, 1854.

† Vide Paget, "Surgical Pathology", vol. ii, p. 155.

frequent, distressing, and laryngeal in character. There were no abnormal sounds over either the larynx or trachea. The expectoration, usually mucous and frothy, was at times copious and muco-purulent. The voice was hoarse, and the breathing slightly stridulous (from above). Occasionally, though by no means constantly, sonorous râle was audible, sometimes over one lung, sometimes over the other. Air appeared to permeate every portion of the pulmonary tissue, though the character of the respiration was slightly exaggerated. The percussion sound was good over every portion of the chest, the symmetry of which was perfect, and no unnatural vocal fremitus existed. The cardiac sounds appeared to be normal. No sensation of discomfort was complained of in the chest; the uneasy feelings of the patient were constantly referred to his throat. At this period, the pulse was natural, the skin cool, the bowels regular, the tongue coated (an habitual circumstance), the appetite and digestion were good, and the general powers unimpaired. Business prevented the adoption of the recommendation then made of confinement to the house; but under the ordinary and topical and general treatment, he became sufficiently well to leave London upon business, which detained him some months in the north. Upon his return, his old symptoms having recurred, Mr. —— consulted Dr. Jenks of Brighton, who made a most careful examination both of the throat and chest. The result of this examination induced Dr. Jenks to suspect that, in addition to the laryngeal affection, bronchial irritation, possibly of a gouty character, existed; gout having occurred in a well-marked form in some members of the patient's family; and treatment partly with a view to such a complication was suggested. I have since learned from Dr. Jenks that, at this period, no physical signs justifying the supposition of serious thoracic disease could be detected.

Some weeks subsequently, Mr. —— again consulted me. A visible change had occurred since our last meeting: the complexion was much altered, partaking of a mingled yellow and leaden tint; and the countenance expressed great anxiety. A constant sensation of soreness was complained of over the region of the larynx and trachea, with the feeling as of a foreign body lodged there,

though but little tenderness was experienced upon pressure. The cough was violent, paroxysmal, and laryngeal in character; the expectoration, difficult, though copious, was puriform, and occasionally streaked with blood; the voice was hoarse and whispering; the breathing much embarrassed; the respirations were about 43 per minute; the pulse was 120, and weak. The tongue was coated with a yellow fur. Upon its right border was an ulcer, about three lines in length and two in breadth, supposed by the patient to have been produced by accidentally biting himself. There was almost incessant eructation of an inodorous gas from the stomach, greatly distressing and exhausting the sufferer. The bowels were irregular, diarrhœa alternating with constipation; the former condition being attended with pain, at times slightly increased upon moderate pressure passing over the region of the ileo-cæcal valve. Deep seated dysphagia existed. The appetite was much impaired, and the strength greatly reduced. Mental irritability was extreme. The sleep was bad. Copious perspirations occurred both by day and night. Irritative fever was now well marked, and emaciation was rapidly progressing. The urine deposited urates and oxalate of lime, and gave occasionally indications of albumen.

At this juncture Dr. Billing saw the patient in consultation. Again a most careful examination of the respiratory and circulating organs was instituted, without eliciting any additional fact of importance. Dr. Billing thought the sounds of the heart hardly as defined as they should be, but refrained from offering any positive opinion as to the exact nature of the case. A moderate mercurial course was suggested. The patient became gradually worse. Alarming dyspnœa either came on spontaneously, or was induced upon the slightest physical or mental excitement. The chest, however, invariably sounded well upon percussion; and the lungs appeared uniformly pervious to air; and an opinion to this effect was given both by Drs. Billing and Jenks, at a still later period of the case.

Swallowing, apparently from pain and obstruction in the pharynx, at length became so difficult that even liquids could scarcely be taken, and it was requisite to attempt the support of the sys-

tem by nutritive enemata. The voice was also nearly extinct. Mr. —— gradually sank exhausted, retaining the possession of his intellects nearly to that last moment.

It may be necessary once more to direct attention to the fact that (except on one or two days) the patient never complained of the slightest uneasiness in the chest, although repeatedly questioned upon the point; but invariably referred the uneasiness to his throat, affirming that, could the obstruction there be removed, he should feel permanently relieved. The ulcer upon the tongue remained stationary for weeks, evincing no disposition either to extend or to cicatrise; and, in this particular, it certainly did not follow the ordinary law of lingual or epithelial cancer.

Autopsy. The examination was made about thirty-six hours after death, by Mr. W. B. Whitfield; and from deference to a special request of the relatives of the deceased, it was conducted with all possible rapidity. So considerable a change had occurred in the features as to render them scarcely recognisable. The entire surface of the body still preserved the peculiar tint noticed during life. Emaciation was general and considerable. No œdema of the extremities existed. The abdomen was slightly meteorised, and purple death-stains were visible upon the back and loins. Upon opening the thorax, the lungs slightly collapsed, and were of a dark blue colour in the interspaces of the deposit now to be described. Both these organs were studded with tubera, varying in size from a pea to a kidney-bean, circumscribed, and imbedded in the proper pulmonary tissue, and principally confined to its anterior surface. They were of a somewhat pearly colour, and, upon dividing them, a milky juice freely exuded upon pressure. Capillary blood-vessels were also obvious in the interior of the deposit. The greater portion of the lower two-thirds of the lungs was in a state of intense hæmorrhagic congestion; and, at the upper part of the left lung, a portion of the deposit had softened down into a detritus much resembling an ordinary tuberculous excavation. At this spot there was adhesion of the pleura. Deposit was also observed in the mediastinum. The inner border of the lungs was emphysematous. No liquid effusion existed in the pleura. The mucous membrane of the larynx was slightly

thickened and softened, and slight superficial ulceration was found in the neighbourhood of the ventricles. Punctiform redness without ulceration extended throughout the entire length of the trachea. The œsophagus was pale, and perfectly healthy throughout. *The cervical portion of the left par vagum was manifestly enlarged.* The heart was pale, flabby, and its tissue readily lacerable. The liver was in a state of yellow atrophy of Lebert,* and this atrophy was suspected during life, from the extended absence of the normal hepatic sound, and want of resistance to the percussing finger. The cæcum was greatly distended with air, as were also in a less degree the colon and small intestines. The kidneys were large and flabby, but no minute examination was made. The remaining organs were, so far as was ascertained, healthy. Neither the brain nor medulla spinalis were examined. A most careful and prolonged microscopic examination of the diseased portions of the lungs was made, including both the solid framework and expressed fluid. Numberless and well-marked cells; caudate, spindle-shaped, ovate mother cells, with large and well-defined nuclei; melanotic cells exhibiting well-marked molecular movement; fat-globules; compound granular cells; fibres; granules; in a word, all those elements which, taken collectively, characterise malignant growth, placed the nature of the case beyond doubt.

Remarks. The case detailed undoubtedly offers many peculiarities, and is perhaps in some respects unique. Viewed in its several phases, it presented an affinity more or less strong to several different diseases. At one time, the symptoms justified to some extent the suspicion of aortic aneurism. There existed *deep-seated dysphagia*, cough, hoarseness, stridor, paroxysmal difficulty of breathing, with absence of the physical signs of lung disease: but this

* This statement requires some modification. The liver was shrunk, of bright yellow colour, and its tissue very fragile. No microscopic examination, however, was made.

view was negatived upon the following grounds. The dysphagia was neither constant nor progressive; there existed none of the physical signs of aneurism; the stridor was from *above*, not from *below;* while the vital symptoms scarcely resembled in any respect those of the disease in question. To laryngeal phthisis the affection bore the closest resemblance. There may be adduced in evidence, cough, hoarseness, and other laryngeal symptoms; muco-puriform expectoration, accelerated pulse and breathing, progressive emaciation, nocturnal perspirations, diarrhœa, pain in the region of the ileo-cæcal valve, debility, febrile excitement, and the urine loaded with urates; while the absence of detectable physical signs did not negative this view; but, had those of excavation in the upper part of the left lung been recognised during life, it would perhaps have rendered such diagnosis almost certain. It may be proper to mention here that possibly the softening process did not commence until within a few days before death, when, owing to the extreme distress of the patient, physical exploration was impossible: at all events, it was not detected in the very many examinations made at an earlier period.

It is hardly necessary to do more than advert to the similarity, with regard to the local symptoms, between this affection and cynanche laryngea, both idiopathic and specific. Difficulty of swallowing is well known to be common to laryngeal disease in general; but as in this case such disease bore no proportion to the inability to swallow, and the œso-

phagus was perfectly normal in structure, the symptom deserves attention, when it is borne in mind that it was noticed by Morgagni also in a case of cancer of the lung (Letter xxii).

In reviewing the various symptoms presented by this case, I would inquire whether they are sufficiently explained by the degeneration which the larynx and the pulmonary structure had undergone; or should they rather be regarded as a result of that sustained by the left par vagum?

Of the degenerations of the lung and trachea, again, which had the initiative? Was the early affection of the throat the result of latent disease of the lung; or did the laryngeal affection, by inducing irritation of the pulmonary tissue, develope cancerous disease in a predisposed subject? But apart from this, it may perhaps be asserted, without fear of contradiction, that, in the actual state of science, cancerous may occasionally so closely resemble tuberculous cachexia, that the differential diagnosis of the two affections cannot with certainty be established.

Case II.

intrathoracic cancer simulating empyema.*

In a paper, published in the *Association Medical Journal* for November 3rd, 1854, I endeavoured to point out the occasional difficulty of diagnosis characterising some forms of intrathoracic cancer. The case reported was one of nodulated cancer of the lungs. The intervening parenchyma being healthy,

* British Medical Journal, March 21st, 1857.

and the signs of pressure absent, no physical phenomena, during life, revealed the character of the disease. The present contribution illustrates the difficulty of differential diagnosis, even when well marked physical changes lent their aid to the physical investigator.

Mary Firmin, aged 26, of healthy family, was admitted under my care June 28th, 1856.

Previous History. She has felt pain in the lower part of the left side, occasionally, since her marriage, five years ago. There is reason to believe that a blow was received on the side about this period. At Christmas, she began to suffer from shortness of breath. For the last four months, the dyspnœa and pain have been greatly increased; the latter extending to the epigastrium, and passing backwards between the shoulders. She is, in addition, troubled with cough, attended with thick, yellow expectoration. Blood has never been observed in the sputa. At the commencement of this period, she was compelled to keep her bed, and could lie only upon the right side. At the end of a fortnight, she was enabled to resume her domestic duties. She suffered subsequently several relapses, which confined her to her bed, and from which she again partially recovered. She has so continued to the date of admission.

Present State. The patient does not suffer so much from the pain in her side, but feels her breath very short. She complains of pain in the back of the neck; she coughs a great deal, and expectorates yellow phlegm; suffers from palpitation, and feels her heart beating upon the right side; feels sick in the morning; perspires at night, and feels very faint; considers she is decidedly losing flesh. The bowels are regular, and there is diuresis. The catamenia are generally regular, and upon the last occasion were profuse; there is no swelling of the ankles. She can now lie only upon the right side.

Inspection. She is of short stature, somewhat thin, of fair complexion, with light-coloured hair. There is no great action of the nares during respiration. There are observed to be distension of

the cervical veins, and pulsation of the right jugular immediately above the clavicle: as well as distension of the mammary veins at the axillary line, more marked upon the left side. The heart pulsates upon the right side between the second and third ribs down to the right nipple. There is marked fulness of the left mammary region, and apparent contraction at the left base, anteriorly and laterally. There is a blister-mark under the clavicle. The respirations are 38 per minute, exaggerated in type.

Palpation. The cardiac impulse is absent over the normal site, and the normal fremitus is absent over the left side. Pulse 108, small, weak, regular, equal in both wrists.

Percussion. There is marked dulness from below the left clavicle over the left side, anteriorly, laterally, and posteriorly, excepting at the upper and vertebral angle of the scapula. The dulness passes the median line anteriorly towards the right.

Measurement. Three inches below the nipple, the right side measures 14½ inches, the left 13½; above the nipple, the right side measures 15½ inches, the left 16.

Auscultation. No respiratory murmur is audible over the left side, with the exception of somewhat hoarse murmur immediately below and above the left clavicle, and at the upper and vertebral angle of the scapula. No ægophony is heard. Upon the right side, laterally and posteriorly, exaggerated blowing respiration is heard. The maximum of the heart's sounds is over the site of visible impulse; these sounds are normal, and unattended by murmur.

July 4th. There were dyspnœa, and cough with scanty yellow expectoration. The patient lay upon the left side, and had a distressing sensation of the heart beating upon the right side. Last night, the lower part of the left side seemed swollen. The kidneys act freely. The patient has pains in the neck, ascending to the face. The pulse, respiration, etc., and physical phenomena, are unchanged.

July 8th. Dyspnœa has increased; the cough is relieved; there is no expectoration. The patient complains of pain in the chest. Dorsal decubitus. Respirations 40; pulse 120, small and weak; perspirations.

July 11th. Dyspnœa is increased; the cough is still less; the decubitus is left-sided or dorsal. The kidneys do not act so freely, Friction sound is heard at the inferior part of the left side; the breath-sound is somewhat more distinct at the spine. About this period, the patient suffered severe relapse, with increase of dulness and perfect absence of respiratory murmur in the clavicular and postero-superior region.

Some few weeks subsequently, the patient was admitted into St. Thomas's Hospital, under the care of Dr. Risdon Bennett. This physician thought it advisable, in order to clear the diagnosis, to recommend an exploratory puncture in the ordinary site of empyema. A small quantity of blood alone escaped; shortly afterwards, an oblong diffused tumour appeared in the left axilla; and now Dr. Bennett felt confirmed in the suspicion, that the case was one of malignant growth.

The patient again came under my notice on October 24th. The symptoms were steadily progressive, and the following phenomena were then accurately noted.

Inspection. Emaciation is general; the face is flushed; a large distended vein runs down the forehead The respirations, exaggerated in type, are 32 per minute; pulse 125, weak, equal in both radials. The jugular veins are moderately distended and pulsating; they are intensely distended during coughing. The left post-clavicular region is somewhat fuller than the right. There is great prominence of the left side, particularly at and above the nipple. The spine is straight; the inferior angle of the left scapula is one inch further from the spine than the right. The left scapula is almost motionless during respiration. There is general fulness of the left side posteriorly. There is a permanent distension of the mammary veins, more particularly the left. A diffused flattened tumour exists in left axilla, corresponding to the axillary line: it is painful at times, and always tender upon pressure. A scar of puncture is seen four inches below the axilla, a little to the left of the axillary line, between the fifth and sixth ribs. The abdomen is tumid. There is anasarca of the inferior extremities (increasing).

Palpation. Vocal fremitus is entirely absent over the left side,

before and behind. There is well-marked sensation of fluctuation between the third and fourth ribs anteriorly, immediately above the nipple. The apex of the heart is felt one inch to the right of the right nipple; the base apparently corresponds to the osteo-cartilaginous junction of the second right rib.

Measurement. In the axilla, the left side measures 16 inches; the right side, $15\frac{3}{4}$ inches. Immediately above the nipple, the left side measures 17 inches; the right side, $15\frac{1}{2}$ inches. Three inches below the nipple, the left side measures $14\frac{1}{2}$ inches; the right side $15\frac{1}{4}$. The left nipple is two inches higher than the right. Both are equidistant from the median line.

Percussion. The left side is universally dull, anteriorly and posteriorly; the dulness passes the median line in front, and extends between one and two inches to the right. The stomachal note is heard in the left hypochondrium. Upon the right side, tolerable resonance exists laterally and posteriorly. The abdomen yields a markedly tympanitic note above, but acquires a comparatively dull character in the lower region, with increased resistance.

Auscultation. Immediately beneath the left clavicle, distant tubular breathing is heard; while, over the remaining portion of the left side, the respiratory murmur is absent. The heart's sounds are heard over the mammary region, diminishing inferiorly. Upon the right side, blowing respiration is heard under the clavicle, with *râle sonore* during inspiration, extending down the lung, laterally and posteriorly. Posteriorly, the respiratory murmur retains, generally, the blowing character; but râle at times mingles with the acts of both inspiration and expiration, acquiring with the latter the character of shrill sibilus. Vocal resonance is somewhat exaggerated over the entire right side of the chest. The maximum of the heart's sounds remains as before stated.

Subsequent examinations did not elicit any additional fact of importance, with one exception; viz., during the last three weeks of life, the apparently gradual extension of a weak respiratory murmur over the middle and posterior portion of the left lung.

The infiltration of the lower extremities, and the abdominal effusion, gradually increased, and the function of the kidneys as gradually became impaired; the dyspnœa became, *pari passu*,

more distressing, and attended with suffocating paroxysms, and permanent semicyanotic tint of the nails. So marked was still the sense of fluctuation upon coughing, between the third and fourth left ribs, that I was tempted to advise the introduction of a fine exploring needle over the most prominent portion of the swelling, with a view to momentary relief, should empyema coexist. The operation gave pain, and only a drop or two of blood trickled down the groove of the needle. During the last three days of life, signs of centric pressure developed themselves, and nourishment could only be taken in the erect and forward position. Death, apparently by asthenia, occurred in the latter end of December.

Autopsy. Present: Dr. Sibson, Dr. F. C. Webb, Mr. Selwood, and Mr. Broughton. A general tendency to decomposition was observed. Upon opening the thorax, a large tripartite mass was seen, exceeding in aggregate bulk an adult head, and of so semifluid a consistence that, in detaching it from its connexions, large quantities of grumous blood and encephaloid matter escaped. The portions of the mass were invested with a fine bounding membrane of glistening character. The large rounded portion occupied nearly the entire left side of the chest, crushing the lung along the vertebral column, and adhering to its anterior face. Firm adhesions existed on this side throughout, particularly between the tumour, spine, and mid portions of the fourth, fifth, and sixth ribs, which latter were markedly softened, and formed a medium of connexion between the tumour and the oblong swelling upon the outer chest-wall. The tumour had carried the heart before it as far as the right nipple, but did not itself extend far beyond the right costal cartilages. By this encroachment, however, together with that of the displaced heart, the right lung also was lessened in volume to the extent of at least one-half, and bound down by adhesions. The second portion of the tumour of the size of an orange, nearly separate from the larger mass, lay behind the manubrium sterni; and a still smaller portion, of the shape of a fig, was situate below the xiphoid cartilage. The heart was normal in size and structure. Considerable effusion existed in the peritoneal cavity. The liver and spleen, etc., were in a physiological condition.

Microscopic examination of the tumour revealed the characteristic elements of malignant growth.

Remarks. The case detailed is replete with practical interest. In its early stage, there were, as it appears to me, some grounds for regarding it as one of empyema, for which affection, indeed, I mistook it. It may, therefore, be instructive briefly to analyse the symptoms, with a view to determine how far such an opinion was tenable. The early symptoms were pain in the left side, cough with catarrhal expectoration, dyspnœa, difficulty of lying upon the affected side, constitutional excitement, etc. The case was at this time considered by her then medical attendant as one of ordinary pleurisy. At the mid period of the history of the case, both vital symptoms and physical signs appeared to conform to such a view. These were pain, cough, dyspnœa, oppression, and hectic phenomena, as emaciation, night perspirations, small rapid pulse. On inspection, the side was enlarged (markedly so in the mammary region) and motionless during respiration ; the percussion sound was dull ; respiratory murmur and vocal fremitus were annulled, except beneath the clavicle and near the spine ; the heart was displaced ; the decubitus upon the affected side.

It is scarcely necessary to recapitulate the phenomena of the later phase of the disease. From the period of the puncture test and the appearance of the external swelling, no rational doubt could be entertained as to the presence of intra-thoracic tumour, even assuming the coexistence of empyema to

a greater or less extent. In further support, however, of the diagnosis of effusion in the first and second stages of the disease, it may be argued, that left sided pleurisy is by far the most frequent, and that contraction ordinarily commences at the base; so that, remembering the several attacks and partial restorations, it was not unreasonable to infer that such adhesions had commenced below, and acquired sufficient firmness to prevent gravitating effusion from renewed attacks. Such effusion might, therefore, thus occasion bulging of the mid portion of the chest, and even tend to the production of an empyema of necessity. The pericardium also, from its extreme traction to the right, might have dragged the left side preternaturally inwards, and further augmented the apparent contraction of the base. Should it be contended, however, that the marked enlargement of the mammary region, the extent of dulness to the right of the mesial line, the enlargement of the mammary veins, the persistent pain, and frequently recurring attacks, the anasarca, etc., should have awakened suspicion of solid growth, we can only remark, that even these signs do not suffice for a differential diagnosis. Many cases are on record of empyema associated with all these signs to a greater or less extent. (See particularly Gintrac, *Diagnosis des Affections Thoraciques;* Mohr, *Monograph des Empyems;* Heyfelder, "Essay on Chronic Pleurisy," in his *Studien im Gebiete der Heilwissenschaft;* Broussais, *Phlegmasies Chroniques;* Andral, *Clinique*, etc., art. iv, obs. 260; and, particularly, that

most singular case of relapsing empyema recorded in the *London Medical Repository*.)

The sensation of fluctuation so evident in this case, and caused by the semi-liquid character of the mass, has been indicated by other observers in malignant intra-thoracic disease, especially by Swett, *Diseases of the Chest*, p. 335; and is constantly pointed out clinically by the surgeon in fungoid disease occurring in parts more accessible to observation. It must, therefore, not be lost sight of in the category of phenomena common to internal malignant disease.

One question must be left for the reader to solve, viz., the origin of the disease. Were the signs of pleuritic irritation to be regarded as the result of changes induced by a tumour of independent growth, or was the mass the result of a *metamorphose* of a primary albuminous pleuritic effusion, as described by Zehetmeyer, *Grundzüge*, p. 138? An argument against this view would be the apparent absence of cancerous growth in other organs—a consequence considered as almost necessary by this observer. (See, moreover, a most interesting case, detailed in p. 339 of his work.)

There yet remains a phenomenon in the case I have recorded which requires comment; I allude to the partial reappearance of a weak respiratory murmur over a portion of the postero-middle region, towards the close of the case. If this were not a conducted murmur from the right lung (which was doubted by some observers), I can only explain it on

the hypothesis that a portion of the tumour had yielded, and permitted part of the left lung to expand into its place.

Finally, with reference to the differential diagnosis of intra-thoracic tumour; when we consider the possible sources of error inseparable from the very nature of certain cases of chest affections and their associate signs, such as those very recently described by Drs. Moutard-Martin and Oulmont, *Med.-Chir. Review*, Oct. 1856; and when we find how, at times, the very ablest observers had been at fault in the diagnosis of malignant disease of the chest, alike from the consideration of the symptoms and the physical signs (the latter, perhaps, are at their minimum of value here), we cite, in special illustration, the well known cases of Boerhaave, Corvisart, Graves, and Stokes, etc., others of less ability may well be excused for hesitancy and doubt. Indeed, it would appear, from a careful collation of the cases extant, that where the family history shows an absence of cancerous disease, where the expectoration is simply catarrhal, marked signs of centric pressure absent, and no external tumour present, the physical signs and symptoms correspond so closely with those of pleurisy, either general or circumscribed, that the diagnosis of intra-thoracic cancer, at its early stages, is in most cases difficult, and in others, perhaps, occasionally impossible. At the same time, it must be borne in mind that relapsing pleurisy, with pain more or less constant, and radiating far and wide, combined with alteration of the chest-wall, and ob-

stinately intractable to treatment, should at all times excite grave suspicion.

Case III.

INTRATHORACIC CANCER. DIFFICULTY OF DIAGNOSIS.*

In some preceding papers I attempted to point out the occasional difficulty, in cases of intrathoracic cancer, of arriving at a satisfactory diagnosis either from the subjective phenomena, or from the application of those physical methods of exploration so valuable in most intrathoracic maladies. It is therefore, clinically, of the greatest importance to avail ourselves of any additional sign which may throw light upon affections so avowedly obscure and defiant of our usual resources. Upon reference to the last paper published in this Journal, March 21, 1857, it will be seen that the appearance of external tumour most materially contributed to a successful diagnosis —a diagnosis amply justified by the autopsy. I have now to detail another case in which such tumour at once enabled the diagnosis to be formed; the phenomena observed prior to its advent having been ill-defined in the highest degree.

The case was watched almost throughout by Dr. Elliotson, who has kindly placed the following history, with the preparation, at my disposal. For the description of the latter, and the general remarks, I must be considered responsible.

In the middle of January last, a medical friend of mine took into his service as butler a young man three-and-twenty years

* British Medical Journal, 1857 or 1858.

of age, who represented himself as a few years older. Was pale, but active, and made no complaint. In the beginning of February, my friend observed him to pant without exertion, to grow paler, and to have a little œdema of the eyelids. In the middle of February, the young man complained, and his pulse was found to be 90; in a week it rose to 100, and it never became slower than this. At the end of the month it was 120, and he had grown weaker, thinner, and paler, and became deaf. He was sent to me on the 4th of March. In addition to the other symptoms, he complained of pain in the loins, so great as to prevent sleep; and sometimes of pain at the occiput and between the scapulæ, and sometimes in front, and sometimes at the side on which he happened to be lying; he had also vertigo. The ganglia under the jaw on each side were swollen, and painful and tender. His pulse was 115; the urine not deficient, 1020 specific gravity, and without albumen or other morbid contents. Percussion and auscultation were healthy. He coughed, but expectorated a very little frothy mucus, which was sometimes reddish. The tongue was rather white; he was very thirsty; and the tonsils were swollen and ulcerated. His respiration was 20, his pulse 112. Two ounces of blood were taken from the arm, but it was neither cupped nor buffed; he was purged with jalap and bitartrate of potass, and dry cupped on the loins. His pain in this part was entirely removed, so that he slept well. The pain between the shoulders continued, and did not yield to dry cupping. He now took preparations of iron in very minute doses, and continued them, but without any abatement of a single symptom. At first it appeared a case of acute inflammatory anasarca; but I soon saw there was some organic disease, though I could not fix upon its seat or nature. Tubercles began to appear on each side of his abdomen, on his thighs and arms, and ultimately in the orbits. His voice cracked. Percussion was dull at the highest part of the chest in front, and at length all over the right half of the chest; and respiration became inaudible to the same extnet; and ægophony was heard to a very limited extent behind, at the highest central points of the thoracic region. His ankles became œdematous. I expressed my opinion that the

disease was malignant, and seated at the highest part of the chest, where an encephaloid mass would be found. He lay in bed for the most part, and always on the right side. He died on the 1st of May.

Autopsy. Upon opening the body, a considerable tumour presented itself in the anterior mediastinum, fusing into the walls of the anterior portion of the pericardium corresponding to the auricles, great vessels, and base of the right ventricle. The tumour was of irregular form, between three and four inches in diameter, occupying the whole of the mediastinum from the anterior to the posterior side of the chest, and extending along the roots of the lung on either side. It was of yellowish hue, and firm consistence, and composed in part of rounded and oval masses, some of which, towards the exterior, were isolated. These portions varied in size from a pea to that of a hen's egg. The largest of them, of botryoidal surface, lay in the triangular space, between the right and left bronchus and upper surface of the left auricle; other portions insinuating themselves between the lobes of the lungs. The central portions of the tumour and that involving the pericardium in front, were of a more homogeneous character, not being separable into masses. The tumour moulded itself around the great vessels; the arch of the aorta, which was not apparently compressed by it, reappeared from the midst of the tumour about the end of the transverse portion. Both venæ innominatæ and cavæ were involved in the tumour, but nowhere obliterated. The venæ innominatæ, however, were lessened in calibre, and evidently compressed. The mass also embraced the anterior portion of the trachea; and the left primary bronchus, in a part of its course, was completely imbedded therein. The second and third ramifications of both bronchi, and the corresponding pulmonary arteries and veins, were, more or less, imbedded in that portion of the tumour which extended to the roots of the lungs in the form of lobulated masses of various size. The trachea and bronchi were nowhere appreciably lessened in size by the pressure of the tumour, even when the bronchi were surrounded by it. The same remark appeared to apply to the pulmonary vessels, which were readily injected. The portion of the tumour

which involved the pericardium thinned downwards from the great vessels, where it is more than an inch in thickness, to the apex of the heart, where it had almost disappeared. This portion of the tumour presented in the least degree the lobulated structure before described. That portion of the pericardium covering the left auricle and ventricle behind was free from disease. The right and left phrenic nerves were traced lying upon and at one part just imbedded in the tumour. The left vagus was traced backwards towards the left bronchus, imbedded, to a considerable extent, in the tumour; the nerve appeared healthy, though stretched, and doubtless somewhat compressed by the tumour. The right pleural sac was filled with transparent lemon-coloured serum. The lung tissue proper, liver, and spleen, were healthy. A single cancerous tumour occupied the right kidney; the other was apparently healthy. There was no opportunity of examining the head. Microscopic examination revealed the elements characterising malignant growth.

Remarks. Upon analysing this most instructive case, we are led to the consideration of the several pathologic conditions with which it might, *in transitu*, have been confounded. The initial phenomena were, apparently, those which indicated simple change of the normal constitution of the blood,—pallor, breathlessness upon exertion, puffiness beneath the eyelids, vertigo, quickened pulse, debility. These symptoms were gradually followed by considerable œdema of the face; increasing pallor; constant and severe lumbar pain, preventing sleep; headache; deafness; pain in the chest, interscapular region, etc.; tender submaxillary glands,—symptoms which, in their aggregate, naturally suggested that the kidney might be the seat of some degenerative process. Careful examination of the urine, however, lent no confirma-

tion to this view, inasmuch as the quantity of water passed was normal, as also its specific gravity; it was, besides, free from albumen or other visible abnormal element; the lumbar pain, also, soon ceased, suddenly and permanently. Coincident with, or immediately successive to the symptoms already recorded, there supervened cough, attended with scanty expectoration of frothy, and occasionally of muco-sanguineous sputa; thirst; white tongue; swollen and ulcerated tonsils; increasing speed of pulse; peculiar cracked voice. In addition to the great œdema of the face, the ankles became slightly œdematous. Physical examination, which at first yielded no results, now revealed marked dulness of the superior sternal region, which gradually extended over the entire right half of the chest; cessation of the respiratory murmur; ægophony. In this phase of the case what did such physical signs import? Aneurism of the thoracic aorta, with secondary pleuritic effusion; the marked œdema of the face, and, in a less degree, of the ankles, the cracked voice, early situation of percussion dulness, character of the cough and sputa, certainly favoured, to some extent, the idea of possible aneurismal pressure upon the bronchial tubes and large venous trunks, the latter result inducing the cerebral phenomena alluded to. Still the early history of the case, the age of the patient, the association and succession of the symptoms, together with the absence of tumour, abnormal impulse or murmur were scarcely reconcilable with the hypothesis of aneurism.

Could the occurrence of tubercular deposit better explain the observed phenomena? The premonitory symptoms were not dissimilar to those of tubercular dyscrasia; and even at a later phase, some of the signs, and some of the symptoms especially, were not opposed to such disease,—the pleuritic effusion being the possible result of tubercular irritation; still, as on the hypothesis of aneurism, there were residual phenomena which were excluded from, and others wanting which should have been included in, the definition of tuberculous disease. Such were the doubts involved in the very nature of the case, so that a satisfactory diagnosis seemed scarcely possible until the appearance of the external tumours; then the suspicion of malignant disease was at once originated, —such disease affording a sufficient explanation of the hitherto anomalous symptoms.

From this, and many other cases recorded by different observers, the great semeiotical value of external tumour occurring in the course of obscure thoracic disease, is strikingly exemplified. Indeed, so great is the value of the sign, that, in the cases named, such tumours should be carefully searched for, and if discovered and determined to be of recent origin, it would probably justify the observer in at once including the case in the category of malignant disease. The widely-spread pain, as also the inutility of treatment, are additional points of value in the diagnosis of this class of diseases.

With regard to the lumbar pain, it is worthy of note, that this symptom was apparently limited to

the period of actual renal deposit, and definitely ceased with the completion of the process and its extension to, and increase in, more remote organs.

Case IV.

CANCER OF PERICARDIUM.*

In some papers upon the subject of intra-thoracic cancer communicated by me, from time to time, to the *British Medical Journal*, it was observed how difficult, nay, impossible, was it, occasionally, to establish a diagnosis either from the physical or rational signs.

The present contribution shows, on the contrary, how, owing to a combination of physical signs such as could hardly exist in any ordinary form of chest disease, a ready diagnosis was permitted.

Alfred Baker, aged 20, by trade a pianoforte-maker, residing at No. 38, Great Titchfield Street, was admitted a patient of the Margaret Street Dispensary for Diseases of the Chest, August 1, 1858. The following particulars were elicited concerning his family history. His father was believed to have died of consumption at the age of 28, after an illness of eleven months. No post-mortem examination was made. His mother still survives, aged 48, and is in the enjoyment of tolerable health, though always delicate. He is the only surviving child, a brother having died from an accidental burn. He himself has never been considered strong, having complained much from the age of eight to fourteen years, of uneasiness at the lower part of the chest. About twelve months ago he had an attack of what, upon insufficient evidence, was considered scarlatina, and since that period has been gradually declining. A marked change in his complexion during the last six months particularly attracted the attention of

* Medical Times and Gazette, September 4th, 1858.

his friends, and seemed to vary from yellow to a leaden-coloured tint. A few weeks ago he consulted a distinguished surgeon, complaining more particularly of great debility, sense of oppression rather than pain about the lower part of the breastbone, dry cough, and frequent attacks of palpitation of the heart. At the present time his appearance bespeaks serious illness. He looks bloodless, with a markedly yellow tinge of complexion, the latter so decided that, were it not for the peculiar blueness of the conjunctivæ, a suspicion of jaundice would have arisen. Emaciation, though marked, had not proceeded to any very great extent. He still complains of oppression at the lower part of the chest, faintness on the least exertion, great debility, thirst, and total want of appetite. There is considerable anasarca of the lower extremities. He can lie, without inconvenience, in any position. The chest is tolerably symmetrical. The right post-clavicular region is rather more depressed than its fellow, and the left jugular vein is slightly prominent. The venous system is, otherwise, not unnaturally distended. The middle and lower sternal regions look somewhat more bulging than natural. The visible apex of the heart is marked, and about half an inch to the left of its normal site. Respiration is somewhat quickened even during repose and freedom from emotion; but becomes greatly accelerated on slight exertion, and faintness being thereby induced. The apex of the heart slightly concusses the hand placed over it, and the sensation of silvery systolic fremitus is, at times, conveyed. Not the slightest cardiac impulse elsewhere can be detected, even during palpitation. The radial pulses are weak, quick, 97 to 106, equal and regular. No great amount of vocal fremitus exists at any part. The chest measurement, one inch below the nipples, gives for the right side seventeen, for the left, sixteen and a half inches. Marked dulness upon percussion exists from immediately below the sternal notch, increasing to the epigastrium, and extending obliquely outwards for about two inches on either side of the sternum. With this area of dulness an extraordinary amount of tactile resistance is conjoined. Both the dulness and resistance are most accurately defined and unaltered by varied position. Every other portion of the chest, anteriorly and posteriorly, yields

the normal resonance. The respiratory murmur is heard equally, though somewhat intensified, over every portion of the chest, excepting the area named. No phenomena whatever exist to justify a suspicion of the slightest abnormal condition of the lungs. With reference to the heart-sounds, the following important modifications are observed:—At the left apex the first sound is clearly heard; but it is difficult to say whether the second sound be audible or not. Over the midsternum, neighbouring parts, and lower sternal regions, the first sound is faintly audible and very distant, the second sound is absolutely annihilated. Over these regions, during inspiration, a creaking sound is heard from time to time.

Soon after these notes were taken his debility increased so much, that he was compelled to remain in bed. Feverishness, great restlessness, slight delirium on dozing, and continued excitement of the heart's action supervened, and he sank in a few days, painlessly, in full possession of his faculties nearly to the close, and without any change in the physical signs. The body was examined twelve hours after death by Dr. F. C. Webb. The features were placid, and marked pallor of the general surface had replaced the yellow tinge so manifest during life. The apparent fulness of the sternal region was still perceptible; the anasarca of the extremities had disappeared; the substance of the pectoral and abdominal muscles was of a very dark colour.

After dividing the cartilages of the ribs, and separating the sternum from its attachments to the morbid structure beneath such union, involving for the greater part the soft tissues covering the sternum, a tumour of considerable magnitude presented itself, completely occupying the length and breadth of the anterior mediastinum, and extending laterally for about two inches beyond the sternum down the lower two-thirds. The fibrous tissue of the anterior face of the pericardium was principally affected, the morbid growth, consisting of one large and smaller nodulated masses, being deposited between it and the pleuræ laterally. The posterior face of the pericardium was apparently free from disease. The internal serous face preserved its healthy, shining character. The tumour was evidently extending upwards into the neck. The

trachea, bronchial glands, anterior portion of œsophagus, nerves, arch of aorta, with its vessels, formed part of the general mass, but not apparently sustaining any great amount of pressure. The right lung was displaced by pressure as far as the costal ends of the ribs. In all other respects, both organs were perfectly healthy. The heart was rather large and flabby, but its valves were perfectly healthy. The pericardial portion of the pulmonary artery was of rather larger calibre than normal, and its elasticity somewhat impaired. The liver was depressed, its right lobe extending two inches below the ribs, and the median lobe three inches below the ensiform cartilage. The gland was unchanged in structure. No other organ was found diseased. The tumour itself was a perfect specimen of hard or scirrhous cancer, creaking like cartilage on section, and exhibiting microscopically the ordinary characteristics. Its length was seven inches, breadth four inches, thickness just over valves three inches, weight of entire mass one pound and a half. The preparation is now in the Museum at the Grosvenor Place School of Medicine, where it has been further examined with great care by Drs. Halford and Richardson. To the former gentleman I am indebted for the above history of the morbid parts.

Remarks. With a view to the differential diagnosis of this case, it is to be considered with what diseases it might, as matter of ordinary practice, have been confounded. They may be supposed to stand in the following order:—Mediastinal abscess; aneurism of the ascending aorta; chronic pericarditis; diseased lymphatic glands; consolidation of lung tissue; empyema. Each of these diseases will now be discussed *seriatim*, and the attempt made to show, how far, in a diagnostic sense, the evidence for the existence of each was to be regarded as insufficient. Mediastinal abscess, the result of inflammation, either originating or excited in the connective tissue of the

anterior mediastinum, might, indeed, in addition to the rational signs of intra-thoracic disease, cause considerable dulness upon percussion throughout the entire length and breadth of the sternum, and render the heart's sounds faint and distant. But, when the yielding nature of the mediastinal walls, etc., and pericardium, is considered, it is, *à priori*, improbable that a collection of pus would give rise to a percussion-dulness so defined, without producing greater displacement of the heart, tension of the epigastrium, and possibly fluctuating tumour above the episternal notch, the latter result being one of considerable diagnostic importance. Moreover, with respect to mediastinal abscess, not only is such pathologic condition extremely rare—greatly more so than even mediastinal tumour—but no recorded case, so far as my knowledge extends, exists, in which the physical signs established the diagnosis.* Not even in Andral's twenty-fourth observation, where a large collection of pus was found after death immediately behind and contiguous to the sternum, although "remarkable dulness was detected by percussion, more especially at the lower part of the sternum, where resonance is usually so marked," was abscess suspected, pericarditis alone being supposed to be thereby indicated, yet both the pericardium and heart were found in a normal condition. The cases

* Mohr, Beiträge zu einer Künftigen Monographie des Empyems, 1839, details two cases, third and eighteenth, of anterior mediastinitis; in both, pain existed; and in both, the lesion was only detected on *post-mortem* examination.

of mediastinal abscess cited by La Martinière, in his well-known memoir, with the exception of the fourth, fifth, and seventh cases, originated rather in external violence or in syphilis. Like the case of Andral, they were attended by pain more or less severe, followed by rigors, oppression, and, additionally, external œdema, swelling of the front of the neck, which latter sign led to a diagnosis of the cases. Without the aid of physical exploration, it is clear that mediastinal abscess and malignant tumour may be confounded, as happened to that excellent practical physician, Schmidtman. In a case of great obscurity, which had eluded the sagacity of several practitioners, Schmidtman noted the following facts. The patient, a labourer, aged 54, had seven years before received a blow upon the chest. He complained of pain over the mid sternum, in which situation a swelling was apparent. The general symptoms were great dyspnœa, dry cough, slow fever, etc. From these phenomena, Schmidtman diagnosed an abscess of the anterior mediastinum. The sternum, already softened, was divided by a longitudinal incision. No pus flowed, but a soft elastic spongy mass gradually protruded through the orifice, which Weihe, in a letter to Schmidtman, after the death of the patient, described as resembling a uterine polypus.*

Aneurism of the ascending aorta may, as I have known, cause evident dulness on percussion over the mid and lower sternal regions, and dislocate the heart

* Summa Observationum Medicarum, etc., vol. i, p. 165.

somewhat to the left, without giving rise to any unnatural impulse, external tumour, or marked sign of centric pressure. Loss of weight, sallowness of complexion, oppression, palpitation, dyspnœa, cough, anasarca of the extremities, may also exist. In the case I have narrated it is true that prominence over the sternal region was observed ; but here, also, the sense of tactile resistance was most strongly marked, and here the first sound of the heart was faint, distant, and the second sound entirely absent. Now, this is contrary to what ordinarily obtains, even in non-pulsating aneurism. However large the sac, and however filled it may be with deposit, the sense of resistance upon percussion is never so strongly marked, while the second sound of the heart is often intensified, and murmur of greater or less intensity a frequent concomitant. Again, had aneurism caused such changes in the heart's sounds at the base, we must assume that the aneurismal sac had passed in front of the heart, and, consequently, dislocated this organ backwards, a condition which would have rendered it impossible that the apex beat should have been felt strongly and nearly *in situ*, while sign of centric pressure could hardly have been absent. In an aneurismal sac, moreover, pain is most commonly complained of. Age, too, must not be lost sight of as an element of diagnosis. Malignant tumour is, I believe, more common at such time of life than aneurism. If, as was seen in the case recorded by Andral, affections of the mediastinum at times give rise to symptoms resembling those of pericarditis,

à fortiori, might a morbid growth of the sac itself lead to error in diagnosis. A remarkable case of tumour in the anterior mediastinum, producing symptoms of hydro-pericarditis, is quoted by Gintrac, from Baron, "Medical Repository," vol. xxxi, p. 423. Hydro-pericarditis would, undoubtedly, cause visible bulging; extended percussion, dulness; render the heart-sounds faint and distant, and engender friction-sound in certain spots; but it would be quite impossible, with such effusion, to feel the apex beating strongly *in situ*, and also hear the first sound clear. Andral, "Nouvelle Bibliothèque Médicale," vol. iii, p. 46, under the title of Chronic Dyspnœa with Heart-complication, records a case in which, upon dissection, the anterior mediastinum was found filled by a large mass of tuberculated lymphatic glands, which involved both the Phrenic and Vagi nerves, etc. The heart and pericardium were both in a healthy state. In this case, however, there was neither prominence of the sternum nor dulness on percussion, while signs of tuberculosis were not without value with reference to diagnosis. Empyema, diseases of lung-tissue, etc., were excluded by the exploration of the remaining portions of the chest. It is perhaps difficult to say, whether in this case the extreme dyspnœa and tendency to faintness on movement were attributable to the irritating influence of the tumour upon the nerves, or to its actual pressure upon the heart, etc.; possibly to the concurrence of both causes. The creaking sound heard at times over the sternal region was, doubtless, due to the

traction exercised between the sternum and tumour during the varying conditions of the respiratory act. The anasarca was, probably, but the expression of the cancerous cachexia.

Case V.

PULMONARY AND ABDOMINAL CANCER SIMULATING PHTHISIS.*

"I now ask your attention to the other specimens before you: they are not only interesting of their kind, but, furthermore, they reveal an error committed in diagnosis. It is, assuredly, no small advantage of public hospitals, that they often enable us to submit our opinions to the severe test of the scalpel. The rebuke we occasionally meet with ought both to discipline the judgment, and teach us moderation in the expression of our opinions; and if the teacher be but honest, he will never hesitate to make his errors subservient to the instruction of others. I will first tell you the clinical history of the case.

About two months ago, a poor married woman, aged forty-two, but recently arrived from America, was led, bent nearly double, into the out-patients' room. She was extremely weak, pale and emaciated, with a face full of suffering, and a peculiarly blue appearance of the conjunctivæ. The breathing was difficult, the cough most troublesome, and the voice somewhat hoarse and whispering; the pulse weak and rapid, 120. Indeed, her condition at once bespoke severe organic mischief. She told us, as well as she could, of her suffering for some weeks from shortness of breath; cough, accompanied by much thick, yellow phlegm; difficulty and pain in swallowing, with frequent return of matters

* Portion of Clinical Lecture delivered at the Royal Free Hospital. (Medical Circular, Sept. 4th, 1860.)

taken, through the nostrils; there were also profuse night-sweats; but dominating even over all these, was a constant pain in the bowels. The whole abdomen was meteorised, and so tender to the touch as to preclude any minute examination. The tongue was red and glazed; the fauces very congested. At the back of the palate was a loss of substance about a quarter of an inch in length and one-tenth of an inch in breadth, involving both soft and bony structures, and evidently the result of past and progressive disease. The larynx was tender on pressure. On examining the chest we found the breathing movement exaggerated and quickened; percussion resonance diminished, and the normal breath sound obscured by râle, probably consonating laryngeal. Menstruation had ceased some months. During the first few weeks after her admission, no very great change occurred requiring mention. The appetite was very capricious; the thirst considerable. The bowels were usually inactive. The cough was most distressing at night; the expectoration decidedly muco-puriform, blood-stain being quite exceptional. The night-sweats were constant and profuse. There was constant uneasiness and pain in the bowels, which always remained meteorised and tender to the touch. The difficulty of swallowing also persisted. Occasionally there was difficulty in passing water. The urine was then scanty, but never albuminous. Latterly, the legs became swollen, and apthæ formed in the mouth. She eventually sank from exhaustion and inanition, after remaining in the hospital about seven weeks.

The autopsy was carefully made by Mr. Hill, and he has furnished me with the following notes:—

"The emaciation was general and extreme; the face still expressive of suffering; the abdomen meteorised. The brain was entirely exempt from morbid change. The larynx was thickened with submucous cancerous deposit, and smeared with purulent matter. Lungs studded here and there with firm schirrous nodules, resembling those in the liver, giving a sense of resistance to the scalpel, and, when divided and scraped, presenting a milky juice, in which abundance of caudate and mother cells were seen under the microscope. Other nodules were of much softer con-

sistence, resembling ordinary crude tubercle. The bronchial glands are noted. A small deposit of similar character was seated in the diaphragm. Much peritoneal inflammation existed, and the liver weighed three pounds and a half. Large collections of cancerous tumour were scattered throughout the substance of the gland, particularly over the left lobe. The spleen has a remarkable appearance: the natural structure is speckled throughout with minute white granular bodies, giving a rough or gritty sensation to the edge of the knife: the organ weighs eight ounces and a quarter. The right kidney very small and wasted from pressure, weighing two ounces. The left kidney is large, and weighs four ounces and a half. The os and cervix uteri converted into a hardened schirrous mass of irregular shape. A large cancerous tumour, weighing ten ounces, had grown from the fourth and fifth lumbar vertebræ and intervertebral substance, also from the sacro-iliac synchondrosis and posterior part of the linea iliopectinea. Upon the rectum, a deposit of similar character to the others named was found: in its centre, there was a small collection of matter. The surrounding tissue was softened."

Remarks. Now, I frankly avow that I regarded this case as one of chronic laryngeal phthisis with sub-acute tubercular peritonitis. At the same time, it was thought that syphilis might possibly be contributing its *quotum* to the mischief, although there were no obvious grounds for such opinion in any part of the history she gave. The error was fortunately of little practical importance, since, with the most perfect medical prescience, we could not have dislodged the disease, or successfully interposed to avert its rapidly fatal tendency. The patient was literally deathstricken. The therapeutic indications were but palliative—to relieve the pain in the bowels, to mitigate the severity of the cough and laryngeal symptoms, and to support the general power. The

difficulties that constantly opposed these indications being carried out, you well know. Here, then, we expected phthisis, but found cancer. Whence the mistake? Was it the penalty of incaution, or the result of unavoidable difficulties in the nature of the case? Look again from your present vantage-ground, confronted with the actual disease, and see whether you can so use the symptoms and post-mortem results as to make them handmarks to a right diagnosis in any future case—or, at least, not point to a wrong one. I have tried to make the most of this double knowledge, but I own I see nothing in what we observed during life, or in any organic change caused by cancer, to have helped us to its diagnosis. The larynx is affected, but only by submucous deposit. The lungs are studded with nodules, resembling unsoftened tubercles. The liver is large (?) and full of firm tubera, but they do not rise sensibly above the gland surface. The abdominal tumour lay too deep for detection, in consequence of the peritonitis and tympanitis it had caused. In truth, it had left only these inner surface results, so calculated to mislead. No large veins ramified over the outer surface of the abdomen, telling of obstruction within. Then, again, of the symptoms I know not which I could fix upon as characterising cancer rather than phthisis. The pain in the abdomen, although so abiding and severe, is, certainly, occasionally met with in tubercular peritonitis. The constipation, too, although in phthisis with peritonitis not the rule, yet is, at times, found to occur.

Lastly, the œdema of the extremities is certainly very often met with in phthisis with or without renal degeneration. It was, probably, in part caused by pressure upon the inferior cava, and in part from the cancerous cachexia. The right kidney, from the, perhaps, varying pressure to which it was submitted, caused the occasional dysuria alluded to. There is one point connected with the physical signs I should again advert to. The chest most certainly yielded defective resonance. This phenomenon I do not pretend to explain. Between the nodules of cancer there existed sufficient of healthy lung tissue to have antagonised the dulness they would have given rise to. I have shown this particularly in one of my already-published cases.

Now, if this statement have, as I believe, tolerable exactitude, there is some justification for the diagnosis made of phthisis with preponderance of abdominal complication. Certain objective phenomena of incalculable value in differentiating cancer were absent. Had they existed singly or in combination, the diagnosis would have been more in harmony with the post-mortem results. The first is the condition of the mammary glands: so complete was their atrophy, that they hardly existed in a rudimentary condition, and certainly without any induration. The second point was the absence of either subcutaneous tubera or other larger undefined swelling. These phenomena, when present, are almost alone sufficient to determine the malignant nature of an otherwise obscure internal disease, and speak a

language far more precise than that of either plessimeter or stethoscope. Lastly, the peculiar tint of complexion, of lemon or leaden hue. This, again, was altogether wanting. It deserves attention, however, especially when we look at the actual condition of the liver. It is, as you see, full of cancerous tubera, and yet not even a jaundiced tint was observed. The main ducts, however, are free. I would also ask you to reflect upon some specific physical or chemical difference between the tint of jaundice and that of cancer. In jaundice, the conjunctivæ are so susceptible of bile tint, that they almost foreshadow the disorder. And this admits of ready explanation, from the circulation of some colouring agent, biliverdine, with the blood. But, in cancer, without hepatic complication, the conjunctivæ are, I think, rarely coloured. This immunity would seem to justify the notion that the lemon tint in cancer is either a mere modification of the spanæmic condition, or that the peculiar colouring agent is in some way rapidly eliminated from the blood and deposited in the tissues.

Case VI.

On some forms of intra-thoracic cancer; cancer of lung, probably, giving rise to symptoms of aneurism.*

But lately, we were occupied with the consideration of the difficulties which, at times, prevent the recognition, during life, of some forms of intra-thoracic cancer. We had an example, in our female

* Delivered at the Royal Free Hospital (Medical Circular, Oct. 16, 1861).

patient, how strikingly this affection may resemble laryngeal phthisis. The difficulty of diagnosis, however, is not restricted to this resemblance. To-day we can advantageously resume the subject; for the case in which so many took an interest has, as might have been predicted, terminated fatally. The utter impossibility of obtaining an examination of the body is the more to be regretted, inasmuch as, if my surmise were well founded, that it was a case of intra-thoracic cancer simulating aneurism of the aorta, no class of cases in pathology needed more detailed observation in order to obtain an efficient clinical history. I must, however, state that the patient had been under the care of several physicians prior to his admission into our wards, most of whom had regarded him as the subject of aortic aneurism. Dr. Leared, however, to whose kindness I am indebted for the case, tells me that his opinion oscillated between aneurism and malignant disease. Although the case has been from the absence of the autopsy left in doubt, yet under such difference of opinion it is certainly too important to pass unrecorded. I propose, therefore, to go more fully into the history, and then to show the grounds for the opinion as to the probability of malignant disease—an opinion based upon the changes incident to the later progress of the case.

The following notes were kindly taken at my dictation by Mr. H. Selwood, one of the Resident Medical Officers:

George Dowling, aged 37, labourer, of middle height and robust frame, intelligent, with a tolerably good family history, was admitted August 15th, 1861. He states that he was in good health

until Christmas last, and followed his ordinary occupation. He has been accustomed to drink freely of porter. At the period named, he felt pain below and in the neighbourhood of the right nipple, darting through to the back. It was a sharp pain, but did not affect the breathing. He felt distended with wind, which could be expelled by friction, and thus relief was obtained. He has not felt any palpitation. About a month ago, his face and neck began to swell; the breathing also became short, and he then began to cough, but did not expectorate. He has never had spitting of blood.

Present Condition.—The countenance bespeaks very great suffering and anxiety. He reclines constantly upon the right side, change to the left being impossible from the pain and distress induced; but he can sit up in bed without distress. The respirations on the left side number 20 per minute. The right side is perfectly motionless. The pulse numbers 92 per minute, soft, easily compressible, and perfectly equal at each wrist. The face is much congested, and swollen uniformly. The pupils are equal in size, and moderately contractile. The neck is dark, much swollen and œdematous, looking as if padded and rigid. No veins are here perceptible; neither is there any visible arterial pulsation, or at the episternal notch. The right anterior surface of the chest is slightly œdematous, as also the right arm and hand; the latter somewhat cold and blue. The right mammary gland is very large, resembling that of a woman; it is also extremely hard and somewhat tender on pressure. From the lower surface of the gland, the induration gradually extends laterally to the epigastrium, and inferiorily, though diminishing, nearly to the iliac region. The edges gradually merged into ordinary œdema. In consequence of this induration, the right side measures $20\frac{1}{2}$ inches, while the left side measures $17\frac{1}{2}$ inches. Over the chest generally, but principally over and below the right mammary region, are clusters of varicose veins, the size of small pearls, turgid with black blood. The corresponding site, posteriorly, presents the same appearance, though in a less degree. Here the dorsal veins are much developed. Over the right hypochondriac region are old scars of leech-bites. The heart's impulse is not visible, but when sitting in bed is apparently felt in the cardiac region. A slight visible

concussion of the right of the chest is observed corresponding to the right side of sternum. On the application of the hand, a diffused and somewhat heaving impulse is readily felt, extending from the third to about the eighth costal cartilage. This impulse is systolic, and without thrill. The entire right anterior surface of the chest is perfectly dull on percussion, from the clavicle to $2\frac{1}{2}$ inches below the false ribs, and laterally as far as the right axillary line. The liver, apparently, extends across the epigastric region. The left surface of the chest seems normal in its results. Posteriorly, the superior scapular regions are apparently duller than natural. Lower down, and to the base of the right lung, the note is unusually clear, of almost tympanitic character. The left, middle, and inferior regions give a normal sound. At the apex of the heart, and a little to its left, both normal sounds are replaced by murmurs. The second or diastolic murmur is louder and prolonged. This character extends to about the mid-sternum, and here the first murmur is attended with shock. This extends over the right anterior surface. The second murmur assumes a somewhat rasping character. The first murmur and shock are synchronous with the radial pulse. Over the right anterior and lateral surfaces of the chest, the respiratory murmur is entirely absent, except just below the clavicle, where slight crepitation exists. Over the left anterior surface, the respiratory murmur is clear and puerile. Over the right scapular region, the murmur is bronchial and hollow. Here the heart's sounds reverberate very strongly. Below there is much *râle sonore*, mixed with harsh respiration and considerable vocal resonance. Over the left scapular region, the murmur is harsh and slightly cooing; below it is puerile, and free from any admixture of râle. The patient complains of constant and intense pain over and more particularly below the right mamma, darting through to the back: it deprives him of appetite by day, and rest at night. He suffers much from difficulty of swallowing in the semi-erect position, but swallows with ease when recumbent. His breathing is laboured, and he coughs much. The expectoration is catarrhal. The condition of the bowels is natural. The urine is high-coloured, not copious, gives slight indication of albumen, and has a specific gravity of 1·035.

Bleeding to the amount of four ounces was ordered, to relieve

the intense venous congestion of face and neck, evidently the result of pressure on the superior cava. A blister to the side, and a diuretic, expectorant, and sedative mixture.

August 17th.—The congested appearance of the face and neck greatly lessened. No relief to the pain in the side. Still suffers from oppression of the breathing. Respiration chiefly abdominal. Can only lie on right side. Greater fulness over the epigastrium. Constant sense of distension. Considerable œdema of right side and arm. Much starting during sleep. Respirations 36 in the minute; pulse 98, slightly jerking. Percussion results unchanged. Moist râle over the back of the right lung. Still very marked reverberation of cardiac sounds at the right superior scapular region. At apex of heart, murmur still replaces first sound. But the *diastolic murmur is gone, and is replaced by shock.* Remaining phenomena unchanged. Mixture continued. Fomentation and poultice to the side.

20th.—Pain in the side still intense. Some pain over upper right scapular region. Other symptoms much the same. Feels weaker. Pulse equal, soft, 92; respirations 31. Diminished temperature of right arm and hand. Marked dropsy of lower eyelids. Tongue very red. Marked resonance of voice at right superior scapular region. Other phenomena the same. Six leeches to the chest. Poultices. Sedative increased.

To the 29th of August no very marked change. At this date there is additionally considerable anasarca of lower extremities. Pain in the side most intense. Breathing greatly oppressed. Copious deposit of lithates in the urine. Traces of albumen absent. The left half of the tongue is quite denuded of its epithelium. Swelling of right side increased. *Varicose veins more prominent.*

September 1st.—Early in the morning, hæmoptysis occurred to a considerable extent, which relieved the pain and dyspnœa, but weakened the pulse. He was mainly supported by stimulants during the day. Lead and opium were given, and apparently lessened the bleeding. Some hours subsequently, the bleeding recurred, seven or eight ounces being brought up at a time. The swelling of the side seemed somewhat diminished; but the

breathing became more oppressed towards evening, and after expectorating six or seven ounces more blood he gradually sank, six hours afterwards.

Remarks. I have now to assign the more immediate reasons for my regarding this case as one of intra-thoracic cancer, rather than, as was originally thought, one of aortic aneurism. You must bear in mind that unless aneurism present an external pulsating tumour, whereby its nature may be established, the mere signs of centric pressure and the phenomenon of impulse may be equally due to any growth within the chest which gradually interferes with the functions of the various organs, and, within certain limits, with that of those also in the abdomen, and which is capable of receiving an impulse from the primary trunks. Hence, any differential diagnosis must be formed from certain peculiarities which these common signs and symptoms offer during the course of the disease. This involves the necessity of a natural or clinical history of the several diseases concerned in the diagnosis. The first point to indicate is the character, situation, and persistence of the pain. Although in aneurism pain more or less severe is commonly felt, yet pain so distressing and obstinate is mostly present only when the sac presses upon the bony structure of the spine or that of the front of the chest. In this case the pain was persistently limited to the right submammary region, and was unrelieved by any change of position of the patient. Now, unless the sac were adherent to the chest-wall, pain would probably have been relieved by the recumbent

or other position removing the sac from actual contact. The peculiar site of the pain is, to say the least, very uncommon in aortic aneurism. On the other hand, it is so peculiarly characteristic of intra-thoracic cancer, that it alone imparts a high degree of probability to the existence of this affection. The second point is the great extent of percussion dulness —viz., from the clavicle to $2\frac{1}{2}$ inches below the right false rib, and laterally to the axillary line. An aneurismal sac must be extraordinarily large that could so modify the normal limits of resonance and displace the liver downwards. This occurrence is so rare, that it also alone would engender suspicion that some other condition than aneurism was present, especially when we call to mind the fulness and equality of each radial pulse. But such an area of dulness is met with in intra-thoracic tumour. The results of percussion and auscultation of the posterior aspect of the chest would guard us against the diagnosis of empyema. Thirdly, the comparatively rapid development of a disease affording such an extensive area of percussion dulness would, unquestionably, speak more for malignant than for aneurismal affection. The fourth point, is the character of the impulse. This was felt from the third to the eighth right costal cartilages. It was diffused, somewhat heaving, systolic, and without thrill. The shock of aneurism is, much more frequently, both systolic and diastolic ; so that the limitation of shock to the period of systole is not opposed to the notion of the growth named. Indeed, it has been, several times, noted in

thoracic cancer. The dysphagia during the semi-erect position and the freedom of the act during decubitus would be the exception rather than the rule in aneurism. The fifth point, is the enlargement and marked induration of the right mamma. The sixth point, is the obstinate resistance of the disease to all remedial measures. The last, though far from least important point to direct your attention to, is the gradual formation of the clusters of small varicose veins over the right submammary region, and the corresponding subscapular and dorsal surfaces.

I think I do not misdirect you in stating that this condition is far more strikingly characteristic of intra-thoracic cancer than of aneurism, and is of the greatest semeiotic value. Dr. Stokes has already drawn attention to these circumstances. Against these points you might fairly urge, in favour of aneurism, the fact of the copious hæmoptysis preceding death, the seat of impulse and the existence of the double murmur. But hæmoptysis, equally considerable, as also murmur, have been observed in cases of thoracic tumour; and we saw how variable the murmur was. So that I cannot help believing that the former phenomena justify the diagnosis of intra-thoracic tumour. Furthermore, I may add that Köhler, who has collated these cases, finds that from a total of 31 cases, 15 occurred on the right side, 8 on the left, while in the remaining 8 both lungs were affected. Where the disease occupied the right side, the decubitus was generally also on that side.

Case VII.

EFFUSION INTO THE RIGHT PLEURA; SUBSEQUENT DEVELOPMENT OF UNUSUAL PHENOMENA; DIFFICULTY OF DIAGNOSIS; PROBABLE SEMI-MALIGNANT DISEASE OF CHEST AND ABDOMEN; CLINICAL REMARKS.*

John W ——, aged 46, single, of short stature and originally very stoutly built, by occupation a brickfield labourer, was admitted June 1st, 1863, supposed to be suffering from pleuro-pneumonia. His father, he stated, died from apoplexy; his mother from cholera. He has three brothers living, one of whom suffers from rheumatic gout; three sisters also are living and in good health. He has always enjoyed good health until the early part of the present year, when he had an attack of rheumatic gout. At the end of a week he went out and caught a severe cold, which settled on his chest, and from the effects of which he has been suffering for the last ten weeks. He had for some time previous to his illness drunk freely of beer (ten pints daily.)

Present Condition.—He complains of debility; uneasiness and oppression at the chest, with a sense of shortened breath; troublesome cough, with scanty and rather difficult expectoration (muco-purulent); the voice slightly hoarse and cracked; thirst and feverishness towards evening, and profuse general perspiration during the night. He can lie with tolerable ease on either side, but prefers lying upon the back. Appetite indifferent; the bowels and kidneys act naturally. His aspect is phthisical; eyes prominent, conjunctivæ blue: and there are signs of general emaciation. No venous distension or pulsation in the cervical region; lips florid. Chest symmetric; no visible bulging. There is greatly diminished breathing movement of the right side; that of the left is exaggerated and quickened, 25 per minute; heart's impulse very faintly visible rather to the left. The right side, just below the axilla, below the nipple, and at its lower portion, measures 17 inches; the left side, at the same points respectively, $15\frac{3}{4}$, 16, and $16\frac{1}{4}$

* Lancet, October 24, 1863.

inches. There is an absence of thoracic fremitus over the right side generally, with the exception of the extreme upper region; equal and moderate fremitus over the entire left side. Heart's impulse extremely weak; radial pulse weak, 112 per minute. On percussion, the right side yields a clear quasi tympanitic-note at its upper portion, perfect dulness and tactile resistance over every other portion; the liver is found to pass beyond the false ribs. The left side yields perfectly normal results.

These symptoms and physical signs underwent little appreciable change for some weeks, with the exception of gradually increasing debility and emaciation, and occasional though slight, nocturnal attacks of suffocative dyspnœa, compelling the patient to assume the sitting posture. Eventually, with increasing dyspnœa, cough, and lividity of the lips, the entire left side of the chest gradually became dull upon percussion, especially at the middle and lower portion anteriorly and posteriorly. The respiratory sounds were now extremely harsh and sibilant. This harsh respiration was after a time followed by large crepitation, more particularly over the parts dullest on percussion—viz., the middle and lower anterior and posterior portions. The expectoration was still muco-purulent. Microscopic examination revealed epithelial cells only, and the corpuscles common to muco-pus. No blood was ever coughed up, or even rust-coloured sputum observed. The heart's sounds were loudly audible over the entire left side. A faint murmur, more distinct with the second than the first sound, existed over the aortic mouth. The impulse was plainly and extensively felt above the left nipple and to the left side. Nearly coincidently with these latter changes, the abdomen began to swell from fluid effusion, and very slight wandering pains were occasionally felt. Three small tubera gradually developed themselves on either side of the linea alba, scarcely moveable, and quite painless. The debility and dyspnœa now became extreme, the pulse exceedingly rapid, and the patient died somewhat suddenly during slight convulsion. No diarrhœa occurred throughout. During the last few days of life the urine was slightly albuminous.

Autopsy, twenty-four hours after death.—The body was moderately well nourished. Purpuric spots existed upon the anterior

surface of the chest. Death stains were visible about the posterior surface of the neck and loins, but not to any great extent. The forehead and face were of slightly yellow tint. The inferior extremities slightly anasarcous.—Head: The dura mater was rather thickened, and generally adherent to the skull. The falx cerebri was somewhat rigid, and slight ossific deposit was found in the tissue of its lower and anterior border. The veins and sinuses were gorged with blood. The pia mater presented here and there a milky appearance. Much fluid existed in the sub-arachnoid space. The brain substance was of natural consistence. A small quantity of fluid was present in the ventricle.—Chest: The right pleural sac contained a considerable quantity of turbid serum, but not sufficient to depress the right wing of the diaphragm, which still presented its normal concavity upwards, and corresponded to about the level of the fifth rib. The pleura was lined by false membrane, which was exceedingly dense at the base of the lung, there fusing into one common mass. At the upper third of the cavity fine cobweb adhesions connected the opposite surfaces. The lower two-thirds of the right lung, completely carnified, were flattened against the spine and mediastinum. The upper third was less condensed. The apex, body, and base of the lung contained nodules of either cancerous or tuberculous character, but they were situate more on the anterior than the posterior surface. The entire weight of the lung was eighteen ounces. The left pleural sac contained no fluid. The lung, retracted, was united by very dense adhesions along the costal edges of the ribs as far as the sixth rib. The adhesions, commencing at the pericardium, extended all round the lung to the spine, and downwards to the diaphragm. Here, also, the false membranes and pleura formed a mass of very considerable thickness. The anterior border of the lung substance was solid from a mottled infiltration. The other portion was very œdematous. Immediately beneath the pleura, investing the anterior face of the lung, a countless number of either miliary or cancer tubercles were seen rising beyond the level of the surrounding tissue, and varying in colour from white to greenish black, giving the face of the lung somewhat the appearance of the roe of a fish. An inch and a half below the apex, and

deep in the parenchyma, larger tubera were found, which grated on section, and seemed composed of small granules. The lower third of the lung was much engorged, semi-solid, and presented throughout a few scattered miliary granules. The weight of the lung was two pounds and a quarter. The bronchial glands were apparently unchanged. The heart and pericardium occupied a considerable portion of the left side of the chest exposed, reaching as far as the costal borders of the ribs, where the pericardium was adherent to the lung, which coursed straight along its left border, corresponding to a line dropped from the lower border of the second to the lower border of the sixth rib. The pericardial sac contained about two ounces of turbid serum. Anteriorly, over the right ventricle, were milky patches of considerable size; and posteriorly, on the inner surface of the pericardium, a layer of recent lymph. The heart was distended by black blood; the coronary veins were much congested; the organ was enlarged, and its tissue flabby; the valves were healthy; its weight was thirteen ounces and a quarter.—Abdomen: The peritoneal sac contained a large quantity of turbid serum. The liver, which was coated by recent lymph, was unusually large and firm, extending three inches below the false ribs; it was of a very dark green colour, becoming lighter towards its left lobe. The gall-bladder was moderately full of dark bile. The weight of the liver was fifty-four ounces. The stomach, somewhat contracted, was bound down by recent adhesions; it was thicker than usual about its lesser curvature. The small intestines were but slightly involved in the adhesion, but were covered with minute granules. A very considerable amount of solid deposit existed about the left half of the transverse colon. The mesentery was studded throughout with miliary granules; and the mesenteric glands were enlarged, red, and softened. There was entire fusion of the omentum, which from the left side of the colon formed a thick dense collar, of almost scirrhous hardness, an inch and a half thick, and an inch and three quarters wide, adhering firmly and extensively to the peritoneum near the left lumbar region, and thence running towards the pelvic region and dividing the two branches, one attached to the peritoneum corresponding to the linea alba, the other passing to the recto-colic

junction. The lumbar glands were not sensibly enlarged. The spleen was apparently healthy, and weighed seven ounces. The capsule of the pancreas was adherent; the organ weighed three ounces, and was bound by adhesions. The right kidney was lobulated, but healthy; weight five ounces and a quarter. The left, also lobulated, weighed five ounces and a half.

Remarks. The following clinical remarks were made:—" Although, during the progress of this case, a diagnosis was made of probable malignant disease, nevertheless, for some time after the admission of the patient into the hospital, it was regarded as one of effusion into the right pleural cavity, directly excited by the exposure to cold of a subject from whose system the poison of rheumatic gout might not have been sufficiently eliminated, It was furthermore thought that, in consequence of this faulty elimination, a certain amount of constitutional irritation might be kept up, and the disease suffered to lapse into a chronic condition, or that the effusion might even be in the way of gradual absorption. For it must be borne in mind that the man had scarcely recovered from an attack of rheumatic gout when the pulmonary affection supervened. The previous good health of the patient, his age, somewhat intemperate habits, family history, and the apparent integrity of the left lung, seemed to favour such a conclusion. On the other hand, the phthisical aspect, the general character of the symptoms—gradual loss of flesh and strength, distressing cough with scanty muco-purulent expectoration, profuse night-sweats, slightly hoarse and cracked voice,—and the site of the effusion, excited the suspicion of possible tuber-

cular deposit. While hesitating, for some time, between these views, new signs and symptoms arose which finally led to the abandonment of both. The breathing gradually became more difficult, the lips livid, and the cough more distressing, without any detectable increase of effusion upon the right side. The left lung, as gradually, became dull upon percussion—a dulness not limited to the apex, but extending over the whole anterior, and partially over the posterior, aspect. The respiration became very harsh in quality, mingled frequently with dry rhonchus, and latterly with a large moist crepitation around the axilla and extending to the base. After these signs had existed a very short time, or, indeed, nearly coincident with them, gradual effusion took place into the peritoneal sac. Occasional and very slight wandering pains over the abdomen attended its progress. Pressure did not, in any marked degree, occasion either pain or tenderness. During this change the conjunctivæ still retained their clear blue colour; the urine, frequently tested, gave no evidence of albumen; the face and forehead gradually acquired a slightly yellow or sallow tint, but the remaining parts of the body were comparatively fair. Three small tubera, if so they may be called, now appeared in the middle of the abdomen on either side of the linea alba. They were of roundish form, slightly movable, and quite painless. Until the attention of the patient was directed to them, he was quite unconscious of their presence. Upon the sides of the neck were four other tumours, but apparently

of different character. They were much more defined, and larger. The largest could be moulded by pressure into any form, which was retained until again pressed flat by the neck-tie. These tumours, the patient stated, had existed very many years; and this statement was undoubtedly correct, for they proved to be ordinary sebaceous cysts. Soon after these changes alluded to, the anasarca of the extremities appeared; and for some days before death the urine gave unequivocal indications of albumen. It was the gradual supervention of these signs and symptoms that now awakened the suspicion of cancerous disease. In brief summary, then: a man originally of very robust frame, hitherto healthy, although of somewhat intemperate habits, and probably inheriting a disposition to rheumatic gout, suffers, at the age of 46, from an attack of this disorder. Before he is fairly well, exposure to cold determines an attack of rheumatic (?) pleurisy. This affection persists for some weeks in a chronic form, and appears eventually to develop the cancerous diathesis, followed by extensive deposit in the chest and abdomen. Some obscure and ill-defined relation would seem to exist between gout, rheumatism, consumption, and cancer. Indeed, there are the strongest grounds for believing that occasionally, in certain cases, actual 'conversion' may ensue."

It is, however, but proper to state that minute portions of the morbid parts were forwarded to Dr. Wilks, but without any history of the case, in order to obtain his opinion as to their microscopic charac-

ter; and that he could not detect evidence of cancer. But on a subsequent examination of the parts themselves, and after hearing an outline of the case, unless injustice is done to this most able pathologist, he was understood to say that so far as regards the abdominal disease, it would have been regarded by the late Dr. Addison as of malignant character.

Case VIII.

EXTRA-THORACIC TUMOUR; SYMPTOMS AND SIGNS OF INTRA-THORACIC DISEASE; DOUBTFUL DIAGNOSIS.

This case occurred at the Royal Free Hospital under the care of Mr. Gant, who requested me to examine the patient's chest. The result of the examination led me to suspect the possibility of malignant disease. Such suspicion proved to be unfounded. The case, however, presented such unusual phenomena that, with the permission of Mr. Gant, I am led to the following brief detail.

John Shields, aged 41, formerly a soldier, an emaciated, unhealthy looking man, of very morose disposition, was admitted into the hospital December 11th, 1863, suffering from a tumour of the chest. His history was as follows. Seven or eight years previously he had undergone amputation of the left thigh in consequence of disease of the knee-joint. About six months before his admission here, he was knocked down by a cab, and the vehicle passed over his chest. When conveyed to the Middlesex Hospital, it was found that several ribs on the left side were fractured. From his own description, there is reason to suppose that the lung was wounded, and that inflammation of the organ ensued. He remained in the hospital nearly six weeks; since that time he has suffered from severe pain in the chest and shortness of breath.

The tumour now existing he ascribes to the accident, as it has

been gradually forming since that date. It is situated upon the left side of the sternum, and is about eight or nine inches in circumference, with an elevation of about one and a half inches from the chest wall;* it occupies the situation of the cartilages of the third, fourth, and fifth ribs, extending over the ribs themselves. The tumour is very hard, fixed, and irreducible, and the integument covering it brawny; it is of somewhat circular though not of abrupt outline, and more prominent towards the centre. There is neither the faintest impulse, thrill, stethoscopic sign, nor sense of fluctuation to be detected; great tenderness exists on manipulation.

The left side of the chest is of irregular form, much flattened anteriorly and laterally, and very contracted at the base; the measurement here is 13 inches, while at the right base it is $16\frac{1}{2}$ inches. The entire left side is perfectly motionless during inspiration, while upon the right side there is very great expansion. The left side is perfectly dull to percussion, except immediately below the clavicle; vocal fremitus is annulled, and the respiratory murmur is extinct except below the clavicle, where it is well marked. Upon the right side, the murmur is every where puerile, (largely compensative). The cardiac sounds are very obscure and muffled. The exact position of the heart cannot be clearly defined, in consequence of the extent and position of the tumour. The pulse is not sensibly affected on either radial artery beyond simple increase of heat. Well marked hectic exists.

A fine needle was passed into the tumour, and a small quantity of treacle-like fluid oozed away.

Progress. The tumour gradually became larger and softer; fluctuation was now evident, and the external integument thinned and reddened. A day or two subsequently, Mr. Gant decided that the fluid was converted into pus and opened the swelling. The same kind of fluid before mentioned escaped mixed with a small

* When first admitted, the tumour was less in size by nearly a third, its surface was covered with largely dilated capillaries, and it had at this time, in the opinion of Mr. Hill, the senior resident medical officer, who carefully watched the case, many of the characters of a malignant growth. This gentleman, however, subsequently altered his opinion as to the nature of the case.

quantity of pus, but the bulk of the tumour underwent no sensible change. The pus appeared to be formed external to the tumour, possibly from the ulceration of the integuments immediately investing it. Shortly after the evacuation of the fluid, the surrounding parts became swollen. "In the evening of the same day, (I quote Mr. Hill's own words,) while in the Hospital Square, the nurse of the ward hastily summoned me, saying the man was bleeding to death. I found him deluged in arterial blood, a large stream of arterial blood was being propelled from the chest at the situation of the wound, quite as large as a forefinger, and indeed, my finger would scarcely cover the aperture, the impulse appeared to come with great force from within, and upon endeavouring to search for the source of the bleeding (whether it might have come from some vessel as the internal mammary or intercostal), I discovered that, instead of diminishing the current I greatly increased it, and, apparently, enlarged the opening. I could feel the rush of blood against my finger, and the whizzing of what appeared to me the blood flowing from the heart. I applied graduated compresses and bound the patient hard and fast to the bed, and kept him in that position four days, when the wound was carefully dressed, and he seemed after some days more to be in a fair way of recovery. He insisted however on leaving the hospital, March 24th, before the wound has healed. The external swelling had quite disappeared on the removal of the compasses, and no unusual impulse remained."

I examined this patient several times after the bandage was removed, and can confirm Mr. Hill's statement. I am quite sure, however, that a collection of matter existed on the left side of the chest, as after any violent coughing, pus welled up from hence and flowed over the side. The left side of the chest was still undergoing contraction.

Remarks. It will not be denied that the foregoing case presented phenomena not only unusual but of more than ordinary perplexity. I confess upon my first examination I was inclined to suspect that the external swelling was of malignant character. The

situation of the tumour, its hardness, the entire absence of either tactile thrill or impulse, of any stethoscopic sign or sense of fluctuation, its latterly rapid increase, the tenderness upon examination,* the condition of the external integument, the oozing of a small quantity of treacle-like fluid following the introduction of the exploring needle—all these signs taken in combination with the altered shape and very contracted base of the left side of the chest, together with the continuance of severe pain in this side, so long after active mischief had apparently ceased, may to some extent have justified an opinion which I now think is clear must have been erroneous.

The view taken by Mr. Gant was, probably, nearer the truth. He thought that, as a consequence of the original injury, an intercostal artery might have been partially lacerated, and the tumour caused by the outpouring of blood into the external tissues, and additionally, that some portion of bone might be diseased. Such view would have been quite compatible with the supposition of an existing pleuro-pneumonia or, indeed, even internal hæmorrhagic effusion giving rise to the special chest symptoms. The difficulty I find in accepting this suggestion is the fact of the tumour increasing so quickly latterly, and so many months after the original injury.

Mr. Hill, who well availed himself of his varied opportunities of considering this case, and who, be it remembered, was (with the other House Surgeons)

* Vide Case 2.

the principal witness of its most salient point, is firmly convinced that the source of the bleeding was the aorta. I cannot but regard his grounds for belief as of the strongest possible character. It may be deemed singular that no abnormal impulse was observed after the removal of the compresses, although the patient remained some time in the hospital. Still, if his opinion be not correct, I have none more satisfactory to offer.

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